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COMPUTERWORLD

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AT&T casts virtual net

Deals with McCaw, others extend user reach

By Joanie M. Wexler
BASKING RIDGE, N.J.

As AT&T nears the final *t*-dotting and *t*-crossing of its $3.7 billion deal with McCaw Cellular Communications, Inc. for 33% ownership, the telecommunications giant is quietly nourishing the rest of a multitentacled integration strategy for ushering customers into the world of "virtual" networking.

Gordon Bridge *envisions EasyLink as 'glue' for SDN links*

AT&T's stated goal is to give customers myriad wired and unwired access and service options for data, voice, video, messaging and other applications connectivity to worldwide resources from wherever they happen to be. The game plan involves several key components, at the heart of which is AT&T's Software Defined Network, a "virtual private network" service in use by thousands of companies.

Enter AT&T's EasyLink Services, a wired messaging network that EasyLink President Gordon Bridge said will serve as the main "glue" between SDN and separate wired and unwired packet networks from AT&T and other providers. The interconnection of SDN to EasyLink, slated for the third quarter, is an as-yet-unannounced AT&T endeavor.

There are about 2,600 virtual private networks in place today among the three major carriers, nearly half of which are AT&T accounts, according to TeleChoice, Inc., a consultancy in Verona, N.J.

EasyLink already connects with 40 wired messaging networks supporting 15 million users; SDN users could communicate with those users once the integration takes place, Bridge noted. In addition, he said, EasyLink will connect SDN users to the wireless RAM Mobile Data packet-based messaging network this year, and the firm is working on a similar arrangement with the Motorola, Inc./IBM-owned Ar-

AT&T, *page 12*

Software giants extend suite deal

By Michael Vizard
SCOTTS VALLEY, CALIF.

■ After seriously underestimating the demand for suites of PC application software, Borland International, Inc. and WordPerfect Corp. last week announced a bundle to counter inroads made by Microsoft Corp. and Lotus Development Corp.

Borland said it intends to begin marketing by the second half of June a software suite that includes WordPerfect for Windows word processing software, the Quattro Pro for Windows spreadsheet and Paradox for Windows relational database.

Priced at $595, Borland Office will be the first suite from a major PC software vendor to include a database.

"Neither WordPerfect nor Borland has the ability to offer a full suite like Microsoft on their own, and I think this will be the first in a series of alliances for both Borland and WordPerfect with other companies," said Krystyna Filistowicz, director of business applications research at Dataquest, Inc. in San Jose, Calif.

"Global success will be depen-

Software giants, *page 7*

Sweetening the mix

The Borland/WordPerfect suite package includes a database and is cheaper than Microsoft's or Lotus' bundle

Vendor	Word processing	Database	Spreadsheet	Business graphics	Mail	Price
Microsoft	✓		✓	✓	✓	$795
Lotus	✓		✓	✓	✓	$750
Borland/ WordPerfect	✓	✓	✓	*	**	$595

*Included in spreadsheet **Will be available at extra cost

NT apps to trickle out

Analysts predict wait of six months from launch

By Michael Vizard
BELLEVUE, WASH.

Microsoft Corp.'s Windows NT may be the most popular undelivered operating system since IBM first began talking about OS/2 in the mid-1980s, and it is likely to travel the same application-light path for the near term.

For example, organizations awaiting Windows NT's arrival can expect at least a six-month wait after its launch next month before a large number of off-the-shelf 32-bit applications become available.

Windows NT installations are expected to hit 1.2 million by the end of 1994, according to analysts at BIS Strategic Decisions.

Analysts said they expect only about a dozen software vendors to have delivered 32-bit applications by the time Windows NT ships. Moreover, Microsoft now says it will have only two of its desktop applications, in addition to its SQL Server database [CW, Feb. 22], available for NT before the end of the year.

"You'll probably see about a dozen [independent software vendors] with deliverable product and a whole host of people with greeting card announcements about how they'll support NT," said John Donovan, an industry analyst at WorkGroup Technologies, Inc. in Hampton, N.H. "It makes you wonder what people have been doing for the past year with their NT developer kits."

Windows NT, *page 15*

Users, feds push EDI as part of health care cure

By Lynda Radosevich
SAN ANTONIO

Pending reforms to cut costs and simplify administrative procedures in the $800 billion-a-year health care industry have providers, insurers and suppliers turning to industry-wide standards for electronic data interchange.

Political pressures are adding urgency to the health care move. Next month, President Bill Clinton's Task Force on National Health Care Reform is expected to present Congress with recommendations to make over the health care system.

And starting in October, the Health Care Financing Administration will require Medicare intermediaries to use the

EDI, *page 14*

No panacea

Despite optimistic predictions, many obstacles remain to implementing EDI across the health care industry. They include:

- Lack of standards and a recognized standards-setting body.
- Cost of installing and maintaining new EDI systems.
- Lack of a national directory of health care providers and payers.
- Concerns about the confidentiality of health records.

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Technology is back, so Esther Delurgio at Mitsubishi Motor Sales meets regularly with colleagues to keep up. Page 67.

ALAN LEVENSON

CLIENT/SERVER

Client/server development tools for Windows are often less capable in complex, cross-platform environments. *Page 73.* *Computerworld*'s Buyer's Scorecard survey gives **Uniface** the top user satisfaction ratings among market-leading tools. *Page 80.* Firing Line users rate **KnowledgeWare**'s ObjectView as competitive but lacking in Windows Object Linking and Embedding features. *Page 82.* Avoid poor performance by making sure your network bandwidth can expand at least 30%. *Page 89*

PC SOFTWARE

Microsoft unveils new messaging products, including scheduling and forms routing packages for Mail. *Page 4.* Work-flow software vendors are keeping an eye on Microsoft to see when and how the software giant plugs **work-flow components** into Windows NT. *Page 45*

PCs AND WORKSTATIONS

AMD is cleared to enter the 486 market, but don't expect a big impact on system prices this year. AMD will ship only about 5% of all 486s in 1993. *Page 8.* Don't look for the dramatic early-1993 **price cutting** to continue in the PC market as the year progresses, market researcher Infocorp warns. *Page 39.* Sun announces additions to its **SPARCstation 10** line of desktop multiprocessing-capable workstations. *Page 16*

SOFTWARE LICENSING

Software vendors are supporting the **Society for Information Management**'s call for improved licensing practices, but observers warn that communication problems will hobble efforts to arrive at a middle ground anytime soon. *Page 8.* **Perot Systems** signs a multiuser, multiproduct license agreement with **CA** that provides the outsourcer with unparalleled flexibility in software licensing options for its clients. *Page 8*

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Workgroups

Notes to get development boost

By Michael Vizard
CAMBRIDGE, MASS.

■ Lotus Development Corp. plans to deliver later this year an interface that will make it easier to create a more robust development environment for its Notes database.

Dubbed Notebook, the Lotus tool will allow Lotus and third-party vendors to integrate graphical development tools with Notes. Notes currently requires application developers to use @Command functions similar to the commands Lotus provides with its 1-2-3 spreadsheet.

These @Commands are relatively easy to master, but they do not provide developers with robust graphical tools that speed and simplify development.

The arrival of Notebook, which is still in alpha testing, is intended to give developers more flexibility in terms of handling screen design and application logic, said Cliff Conneighton, Lotus' director of marketing for communication products.

"Notebook will make it easier to integrate something like Visual Basic, per se," Conneighton said.

Among other things, Notebook will allow developers to create applications that can perform joins across Notes and SQL databases.

Developers working with Notes said they would welcome the arrival of more robust development tools. "It would enable people to pull stuff from other databases and tie Notes into other systems," said Norman Weizer, president of Weizer Associates, Inc., a consulting firm in Lexington, Mass.

Conneighton said Lotus is debating whether it should make it easier for developers to deploy applications by providing a runtime license for Notes.

The debate, Conneighton said, centers on the trade-off associated with making runtime applications available that do not allow end users to create applications.

"A runtime license would make it less expensive to deploy a lot of clients, but Notes is a lot like 1-2-3, and we want uninhibited end users creating applications," Conneighton said.

"Since a Notes client is $495, I can see some value in a runtime license. There's definitely a catch-22 for Lotus, but I would love it," said Randal Zahora, president of Workgroup Productivity Corp., a Notes reseller and developer of Notes applications in Oak Brook, Ill.

Lotus' earnings fall 41%; 1-2-3 for Windows blamed

Lotus Development Corp. said last week that first-quarter earnings dropped 41% to $12.3 million on flat revenue of $227 million.

While a mix of new products has helped Lotus maintain revenue during the bruising PC software price war, the drop-off in earnings was attributed to costs incurred when Lotus misjudged the initial impact of Microsoft Corp.'s Windows on the spreadsheet market.

Lotus' current 1-2-3 for Windows, which the company developed following the dissolution of the Microsoft/IBM alliance on OS/2 in 1990, has drawn lukewarm reviews. A new version, code-named Darwin, will be announced May 11.

"Microsoft's Excel and Borland's Quattro Pro are fine products, and then there are people who ride around on Greyhound buses," said Dan Atkins, a consultant at Northwest Airlines.

Overall, Lotus' Windows-based products, which include its Ami Pro word processor, 1-2-3, CC:Mail and Notes offerings, account for 49% of Lotus' revenue. However, DOS application sales have fallen 42% on a year-to-year basis.

Shipments of DOS spreadsheets fell from 4.4 million units in 1991 to 2.9 million units in 1992, according to International Data Corp. in Framingham, Mass. Shipments of Windows spreadsheets rose from 2.3 million to 4 million in the same period. —*Michael Vizard*

Corrections

- A story in the April 19 issue incorrectly cited the price of the developer's edition of WordPerfect Corp.'s WordPerfect Informs. The product lists for $495.
- Because of an editing error, research results on Fortune 1,000 companies in the April 19 issue were attributed to Jim McKelvey at Spring Industries. The comments on the CSC Index, Inc. research should have been attributed to Fred Wiersema, a CSC Index vice president.

Computerworld honored

COMPUTER PRESS AWARDS

Computerworld was named best computer newspaper of its size last week by the Computer Press Association.

Computerworld won in the category "Best computer newspaper—circulation more than 100,000" in the annual awards.

In addition, senior editor Johanna Ambrosio was one of two runners-up in the category "Best news story in a computer publication" for her March 2, 1992 story "CA business policies anger some large shops."

The judges called *Computerworld* "a well-rounded weekly blend of news, trends and service pieces in an attractive package. *Computerworld* is well-written, to the point and distinguished by its sense of humor. Both the feature writing and commentary are lucid and entertaining. *Computerworld* proves that you can deliver timely information and services with wit and style."

The Computer Press Association is a nonprofit organization that promotes excellence in computer journalism. Its eighth annual awards drew a record 1,100 entries, the association said.

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DOS word processing rivalry flares

By Michael Vizard
SEATTLE

■ While Windows remains the fastest growing area for word processing software, WordPerfect Corp. and Microsoft Corp. continue to slug it out in the DOS arena.

Microsoft next month will release Version 6.0 of Word for DOS, which should arrive at about the same time as WordPerfect's expected delivery of Version 6.0 of its DOS namesake word processing package.

While WordPerfect currently rules the DOS word processing market, Microsoft has been able to leverage some of its dominance of the Windows market in the DOS arena because sites have to support the same word processing software package across both platforms.

In contrast, WordPerfect stumbled with its first Windows implementation, a situation only recently rectified by the arrival of Version 5.2 for Windows.

"We use the DOS version of Word because not everybody here has a PC that can run Windows. We still have a lot of people with XTs," said Gina Chabot, who provides support services for approximately 3,500 PCs at Unum Life Insurance Co. in Portland, Maine.

Favorite features

After beta-testing Version 6.0, Chabot said Unum plans to make both Version 5.5 and 6.0 of Word available. In particular, Chabot said, users at Unum were most impressed with some of the Word for Windows features that have been added to the latest DOS release. They include drag-and-drop editing, tables, TrueType fonts, automatic bullets and an improved print preview mode.

"Word is our corporate standard," Chabot said.

Version 6.0 of Word will run on MS-DOS 3.0 or higher and requires a minimum of 384K bytes of memory.

WordPerfect's expected delivery this spring of Version 6.0 of WordPerfect for DOS will be the company's first 32-bit implementation.

The new WordPerfect release seeks to bring Windows-like features to DOS users by providing a choice of standard text mode, graphical mode or full-page mode [CW, March 22].

Microsoft seeks mail solutions

By Lynda Radosevich
PORTLAND, ORE.

Microsoft Corp. touted new scheduling and forms routing software at a Microsoft Mail user conference last week and laid out its vision for client/server computing based on Microsoft products, including Mail.

While users reacted favorably to the messaging products, many came to the conference trying to solve current Mail problems rather than looking for new technologies.

"I'm looking for Mail to [IBM's] OfficeVision/MVS gateway," said Jerry Dale, a programmer/analyst at the Public Service Company of Colorado, the state's largest utility.

Mail route

80% of E-mail messages are sent within a workgroup, and only 20% are sent across a wide-area network, according to AT&T's EasyLink service.

Using SoftSwitch, Inc.'s Central to integrate Mail and IBM's Professional Office System messaging does not allow users to use their calendaring and scheduling programs, a problem that a good gateway might alleviate, Dale said. (Microsoft has an OfficeVision/VM gateway but does not have plans to provide an MVS gateway.)

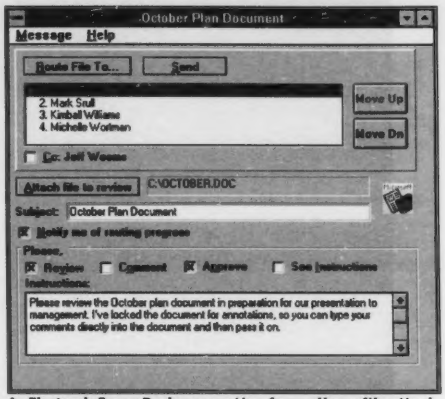
In the conference's keynote address, Daniel Petre, Microsoft's Workgroup Division vice president, noted that scheduling is likely to be the biggest application for electronic mail immediately but that Microsoft envisions E-mail as the invisible infrastructure for transporting all types of data.

"Mail might be a better, more secure platform for remote data communications than copying data from one server to the next," Petre suggested, setting the stage for a demonstration of Schedule Plus and Electronic Forms (E-forms) Designer (see box below right).

Despite Microsoft's general salute to "openness," both packages run exclusively on Microsoft's Windows operating system, a fact that E-forms beta-test user Dan Lim, supervisor of electronic information exchange at Unocal Corp. in Anaheim, Calif., said would exclude some users.

However, for Windows shops such as Perkins Coie, a 700-employee law firm in Seattle, the products could meet their needs. "E-forms was cool," and the $395 price tag is "cheap," said systems analyst Chris Steele.

Microsoft also laid out plans for future Mail developments. The firm said it will consolidate the features of all its Mail clients and, with operating systems developments, will introduce rules-based message sorting and filtering.



An Electronic Forms Designer *routing form allows file attachments to be routed serially to a list of users*

Product managers demonstrated the next Windows Mail client, expected next year. It will let users see messages from the Windows file manager, include a tool bar that enables rich text formatting and allow people to link files to messages rather than embed them to save disk space.

Also on the burner is a graphical DOS version of Mail with pull-down menus and other Windows-style goodies.

On the server side, Microsoft's unannounced Enterprise Messaging Server (EMS) will feature X.400 transport and X.500 directory services and will require NT-based hardware. After the keynote, Petre said Microsoft will begin using the EMS internally in October and hopes to ship it in the second quarter of 1994. Petre also said Microsoft hopes to ship a Unix client for Mail at the same time.

In the mail

Microsoft Mail products debuting last week included the following:

- Microsoft Electronic Forms Designer, an electronic forms designer and router based on Microsoft's Visual Basic.
- New gateways to IBM's Profs, Novell, Inc.'s Message Handling Service and fax.
- Software from Link-Age Office Information Solutions, Inc. in Ottawa that links Mail and IBM's OfficeVision/MVS mail directories

(see story page 52).

DOS, System 7 blend eyed

By James Daly
CUPERTINO, CALIF.

Apple Computer, Inc. engineers are reportedly experimenting with a modified version of System 7.1 that would run on DOS-based machines using Intel Corp.'s I486 microprocessor, sources close to the company said.

Apple's implementation would reportedly sit atop an upcoming release of Novell, Inc.'s DR DOS and be positioned as an alternative to Microsoft Corp.'s DOS and Windows. Sources said the pair could also offer the DR DOS and Macintosh interface combination as a client to server-based applications running Unix.

Apple engineers have kicked around ideas like this in the past, but there is no certainty that the effort will ever see the light of day. Regardless, Apple's move to build a version of its operating system for another platform represents a fundamental shifting of gears for the once fiercely proprietary company, where even two years ago anyone suggesting such an idea would have been branded a heretic.

In the works

Apple's engineers are reportedly also working on a native version of AppleTalk networking software on the 486 platform. Macintosh applications, however, would have to be recompiled to run on the new operating system.

Neither Apple nor Novell would comment on the prospect of a 486-based version of the Macintosh operating system.

If the implementation comes to fruition, it could potentially help Apple gain market share, especially in mixed environments. "I have a lot of users running DOS who'd love to be able to use the Mac interface," said an information systems director who works in a mixed environment. "Users love choices."

Some analysts questioned the efficacy of such an effort, unless it is a simple exercise in porting the Macintosh operating system to other platforms.

"If something like this had arrived four or five years ago, I would say it would be brilliant, but right now it seems kind of screwy," said Pieter Hartsook, editor of "The Hartsook Letter," a Macintosh-specific newsletter in Alameda, Calif. "I'm not sure if there is any advantage to going out and buying a Dell PC, loading it down with extra software and hardware, then trying to make a Mac out of it. Especially since the prices of Macs have dropped."

End users also had reservations about whether such a half-breed system would be worth the headache.

"Part of the magic of the Mac is that you have the hardware and software so tightly linked," said Dave Lustig, manager of technical services at Bose Corp. in Framingham, Mass. "So the question becomes whether they can make an Intel configuration and operation as easy and intuitive to use as a Mac. If it was kludgy, it wouldn't add a whole lot of value."

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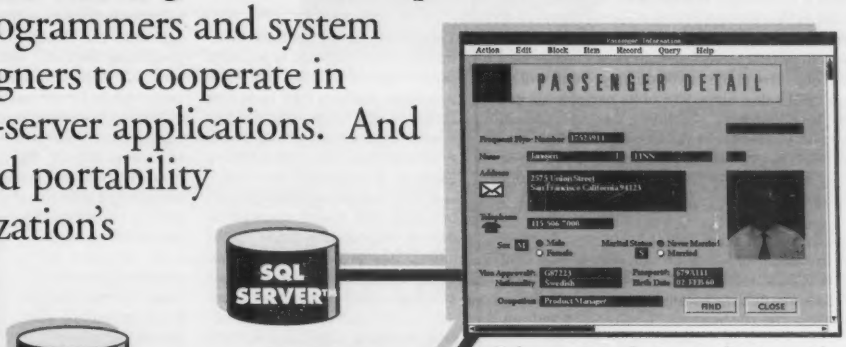

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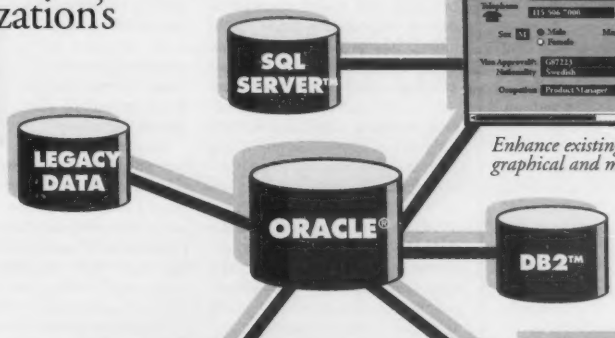

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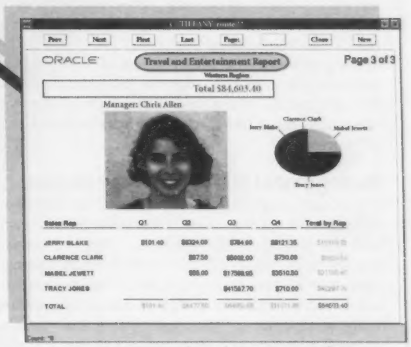

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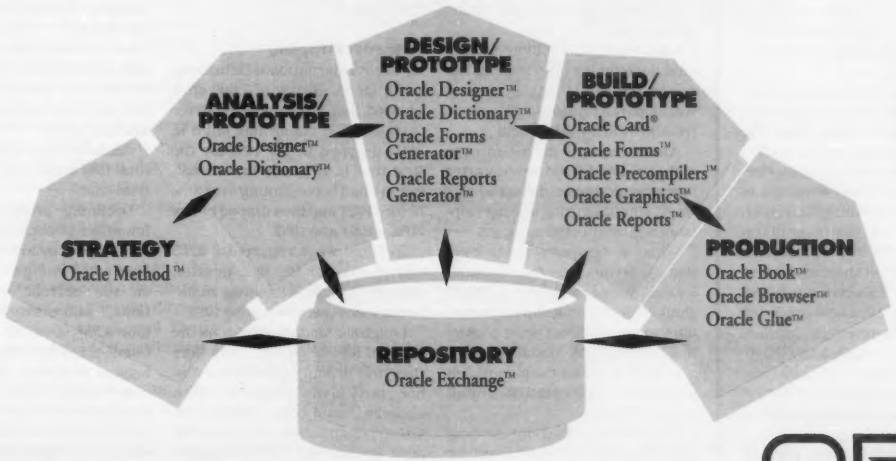

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News Shorts

IBM makes Adstar independent unit

IBM turned its $6.1 billion **AdStar** storage line of business into a full-fledged independent subsidiary last week and named storage entrepreneur and 1980s-era Congressman Ed Zschau as its chairman and chief executive officer. IBM Vice Chairman Jack Kuehler said the chief objective of the 14,000-employee unit will be to boost OEM sales, since 90% of its peripherals are sold to other IBM units. "Within a five-year period, 30% to 40% of our revenues should be coming from outside of IBM," said Ray AbuZayyad, AdStar's president and chief operating officer, who has managed the unit since December 1991.

IBM, Object Design align

Object Design, Inc. this week will announce a deal with **IBM** to jointly develop and integrate its ObjectStore database with IBM's evolving Application Development Platform. The deal, which will also include an equity stake by IBM, is expected to result in $25 million in sales to Object Design, a company spokeswoman said. IBM is also working with object database vendor **Versant Object Technology** on a separate AIX computer-aided software engineering effort that is under way in Toronto.

EDS signs deal

Electronic Data Systems Corp. last week bagged a $1 billion deal and launched a new buzzword when it signed a 10-year "cosourcing" agreement with Swedish business conglomerate **Kooperativa Forbunder** (KF). Under the arrangement, which is expected to gel by early summer, EDS will take over KF's information technology company — **Apiron Information** — as well as provide information technology-related services to the retail-oriented cooperative societies that KF represents.

Management interoperability shown

Eleven firms participated last week in the first demonstration of interoperability between the two rival network management standards: Simple Network Management Protocol (SNMP) and Common Management Information Protocol (CMIP). The demonstration, which took place at the International Symposium on Integrated Network Management in San Francisco, used the Network Management Forum's Omnipoint protocols for interconnecting SNMP and CMIP systems. Also, **NetLabs, Inc., Control Data Systems Corp.** and **Breakaway Software** cooperated in a demonstration of what are said to be the first products to manage electronic-mail systems via SNMP. NetLabs provided the network management platform; the other two vendors provided the E-mail products.

SHORT TAKES Frank Gaudette, executive vice president of operations and chief financial officer at Microsoft, lost his fight against cancer late last week. The 57-year-old Gaudette began his tenure at Microsoft in 1984 and organized the firm's successful public offering in 1986.... **Legent Corp.** reported earnings of $18.4 million for its second quarter ending March 31, almost double the amount from last year's comparable period. Revenue remained flat at $102.6 million and the company said it "clearly fell short of our new license revenue expectations."... **KnowledgeWare, Inc.** started shipping ObjectView 2.0, a new version of a Microsoft Windows-based client/server development tool from **Matesys Corp.**, which KnowledgeWare bought out in February.... Object-oriented tools vendor **Easel Corp.** reported a first-quarter loss of $489,606 on revenue of $6.7 million, $2.4 million behind its first-quarter 1992 sales figures.

News shorts, *page 16*

AMR unit poised for flight

Move to IS services outside travel niche viewed as risky

By Nell Margolis
FORT WORTH, TEXAS

AMR Corp.'s newly sculpted information technology unit is poised to target clients outside the AMR/American Airlines fold, including those in the suddenly sizzling health care arena, group President and Chief Executive Officer Kathy M. Misunas said last week.

Sabre Technology Group's debut early this month sparked industry speculation that AMR might have cobbled five information systems businesses together into one highly autonomous unit that it could spin off or sell. Whether or not such a scenario unfolds is irrelevant, Misunas said: Sabre Technology does not need an independent corporate charter to serve external customers.

"All we need," she said, "are the right skill sets to handle the kinds of business we're going after and a team-type approach" that blends technology and business skills and goals from the ground up.

Industry observers, however, greeted Sabre Technology's creation [CW, April 12] and its outward-seeking agenda with more than a dollop of skepticism. AMR has spent the past several years battling a ruinous economy and the past several months scrambling to shore up its coffers and image after the collapse of a once-promising business venture that now has AMR embroiled in lawsuits with its former partners.

Moreover, several analysts noted, internal IS shops have tended to fare poorly in the ruthlessly competitive independent commercial market. The list of firms that have stumbled on the IS-as-profit-center route includes such notables as Kimberly-Clark Corp., Sears, Roebuck and Co. and Mellon Bank Corp.

> AMR and Sabre might have the right mix of skills and savvy to make a go of it.

Yankee Group analyst Susan McGarry, who usually takes a jaundiced view of firms' attempts to turn their successful IS shops into independent profit centers, said AMR and Sabre Technology might have the right mix of technology skills and management savvy to make a go of it.

"What makes it such a bad idea is that even the most sophisticated companies grossly underestimate the marketing skills needed to make it outside the protected [intracorporate] atmosphere," she said.

In its first several weeks of formal existence, Sabre Technology has been divided into two parts, said Misunas, a 20-year American Airlines veteran who served as president of Sabre Travel Information Network until it was folded into the approximately 10,000-person business she now heads.

A team-run development department will be at the exclusive technological service of customers. The remainder of the group will market a broad array of technology services to information- and networking-intensive businesses that could benefit from the same mix of talents that run an airline and travel services business.

In fact, Misunas said, other travel- and transportation-oriented firms will rank among Sabre Technology's early target clients. "But I can also see us in industries like retail and health care," she added.

Initially, she said, Sabre Technology will limit its sights to businesses needing automation services. "Then, for instance, we might acquire a company that has, say, health care automation strengths but needs a network."

Amdahl to cut 1,100 to rein in overhead costs

By Jean S. Bozman
SUNNYVALE, CALIF.

For the third time in six months, Amdahl Corp. has announced wide-ranging layoffs to bring overhead into line with declining profits from IBM-compatible mainframe sales.

Last week, $2.5 billion Amdahl said it would lay off 1,100 employees by the end of May. By June it will employ a total of 7,400 — down from 9,700 in the fall of 1992.

Amdahl said it moved to cope with an anticipated first-quarter loss expected to be disclosed this week. Manufacturing and development will be affected most.

While a company spokesman tied the layoffs to erratic demand for mainframes, industry analysts chalked up the pink slips to a combination of cutthroat price competition among IBM, Amdahl and Hitachi Data Systems Corp. and high inventories of new machines by all three vendors.

"Amdahl is sending out the message that there is skepticism for long-term demand," said Bob Djurdjevic, president of Annex Research in Phoenix.

Djurdjevic said all three mainframe vendors are waiting several months while large users evaluate dozens of models announced in the first quarter.

Interest slipping

A recent International Data Corp. (IDC) global survey of 7,000 sites showed that projected growth for installed IBM mainframe MIPS in 1993 dropped below 10% for the first time in 10 years. In contrast, growth had been running over 35% before 1991 and then dipped below 20% in 1991 and 1992.

IBM last week reported a $285 million loss for the first quarter, stemming from slumping mainframe sales (see chart page 109).

Longtime Amdahl users took the news of layoffs calmly. "Any time that your primary mainframe vendor starts laying people off, it's a concern," said Steve Bishop, assistant information services manager for the city of San Antonio, which has an Amdahl 5990 machine. "As long as they can continue with R&D and field-engineering support, it shouldn't impact us," he said. Amdahl said support levels would be unaffected.

But future information systems plans may hinge on Amdahl's market perception.

"I am concerned with the viability of all mainframe vendors," said Ron Kriegel, resource manager for the state of Illinois' Central Management Services data center in Springfield, which supports 80 state agencies with Amdahl and IBM mainframes. "I do not want to see just one competitor out there because that will cost us a great deal of money."

Amdahl has roughly 15% of the total IBM mainframe market, analysts said.

Declining profits left Amdahl few alternatives, analysts said.

"I think they are taking responsible cost-cutting measures based on the current market conditions," said Steve Josselyn, a senior analyst at IDC's Worldwide Commercial Systems Group. "The biggest challenge for any mainframe vendor is to reduce price/performance costs to levels competitive with alternative platforms such as LAN and Unix servers."

Software giants extend suite deal

CONTINUED FROM PAGE 1

dent on alliances that provide the best products. This will be done by creating virtual corporations as an alternative to mergers," said Borland Chief Executive Officer Philippe Kahn.

Kahn added that the arrival of Borland Office will solidify an informal alliance that has been in place between Borland and WordPerfect for the past year [CW, June 1, 1992]. The two companies also agreed to share development resources.

Kahn said Microsoft and Lotus have sold more than 1 million suite packages and that Borland misjudged the impact of suites since Microsoft began selling Microsoft Office two years ago.

"What can I say, I was wrong," Kahn said.

"I told Borland a year ago that the thing that was hurting them most was Microsoft Office, which has a street price of $450. Borland Office should be priced well below that so they should kick butt on Microsoft," said Dan Atkins, a consultant at Northwest Airlines in Minneapolis.

Tough sell

Nevertheless, the alliance between WordPerfect and Borland does not appear to be enough to get users who have already committed to Microsoft Office to switch to Borland.

"The people who need a database are a distinct group from the people who use other desktop applications," said Glen Jurmann, section manager for office technology at Baxter Healthcare Corp. in Deerfield, Ill.

Complementing Borland Office will be a separate Workgroup Extension Pack from WordPerfect, scheduled to be available in the third quarter, that will include WordPerfect Office, WordPerfect InForms and WordPerfect presentation graphics software.

Different strokes

The strategy being taken by Borland and WordPerfect differs greatly from that of Microsoft and Lotus. While not offering databases in their suites, Microsoft and Lotus have added electronic mail and presentation graphics to the word processor and spreadsheet core.

"Borland does not want to tie itself to one E-mail package, and it thinks the graphics in Quattro Pro are comparable to Microsoft's PowerPoint graphics package. Meanwhile, WordPerfect does not want to jeopardize its messaging strategy, which is going to be the core of a range of products," Filistowicz said.

Lotus countered that while it does not currently have a database, less than 15% of Windows customers need a database. As a result, Lotus is not overly threatened by the Borland move, said Paul McNulty, director of product marketing at Lotus.

Microsoft, however, struck a more ominous tone. "The inclusion of a database in a suite represents neither a short-term nor long-term advantage," said Hank Vigil, director of marketing for applications at Microsoft.

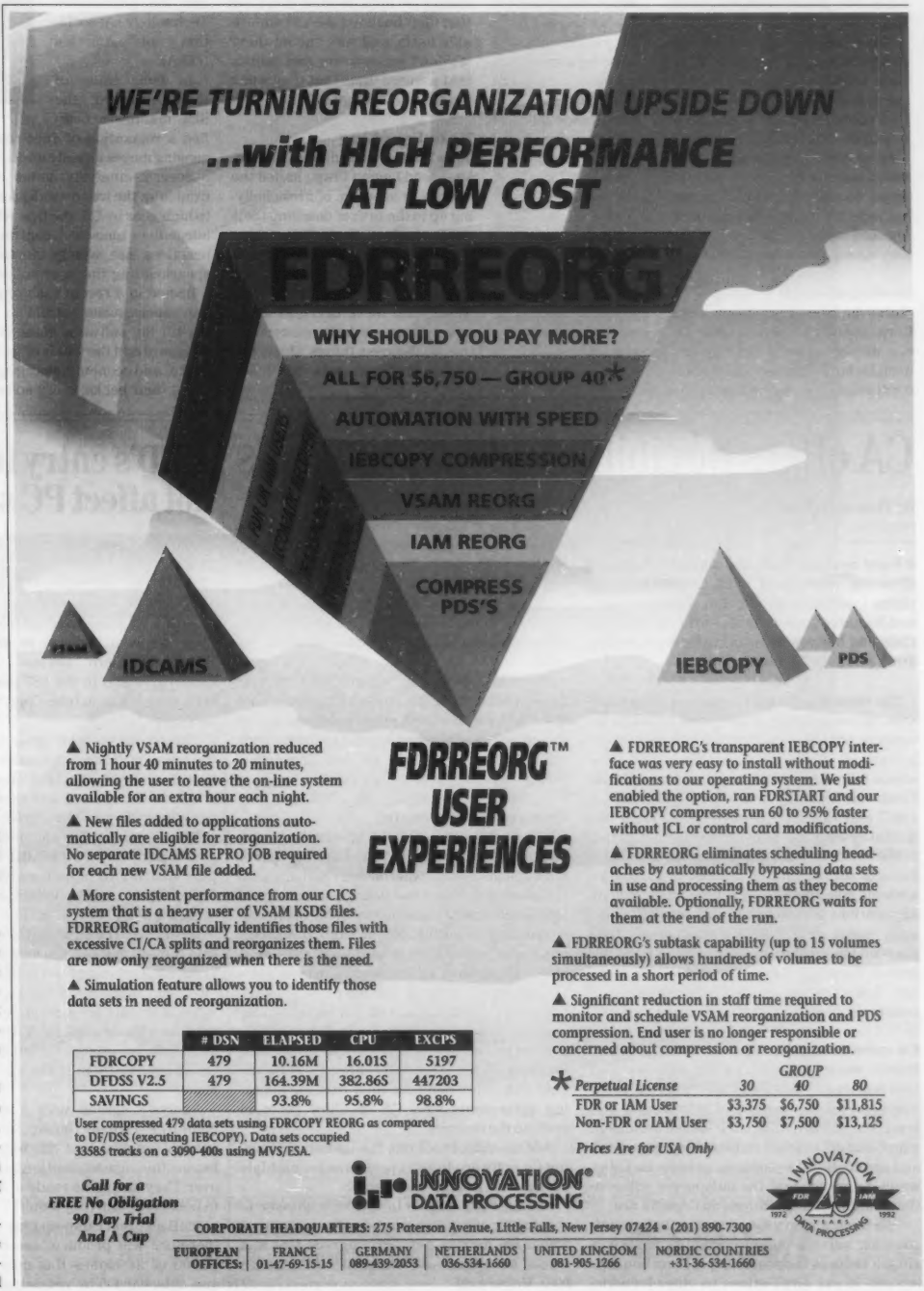
"Clearly, we've been thinking about this and it's an obvious direction for us," he added.

Vigil said the company expects that more than 50% of Excel spreadsheet and Word word processing shipments will come through Microsoft Office in 1993.

Kahn and Ashton *ready for suite alliance*

Microsoft and Lotus stressed that suites require the tight integration of multiple software packages, which they suggested will be difficult for two companies with diverse cultures to accomplish.

WordPerfect Chairman Alan Ashton countered that WordPerfect users will be able to import Quattro Pro spreadsheets into WordPerfect and that the two companies will be working together on implementing support for Version 2 of the Object Linking and Embedding protocol.



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Licensing plea gets mixed reviews

By Nell Margolis

Leading software vendors last week enthusiastically endorsed the Society for Information Management's (SIM) plea for improved licensing practices, but observers warned that arriving at an equitable middle ground could take some time.

Their reasoning: An already awkward process — trying to balance users' wishes to pay only for value derived from software and the supplier's need to reap a profit — will be hobbled by the difficulty forging accords in an area where the paradigms are so new and the terms so vague that vendors are not sure what users are demanding and users cannot tell when they have gotten what they want.

Vendor moves

Recent vendor efforts to revamp software licensing include the following:

IBM opened up rigid tiered pricing and embraced multiple operating systems pricing.

Digital Equipment Corp. has begun initiatives in response to eight of the 10 licensing concessions demanded in SIM's recent position paper.

Lotus Development Corp. offers concurrent licenses and a license management facility to track them.

No disguising it

Moreover, said International Data Corp. analyst Ed Acly, neither users' display of unity nor vendors' acclaim for it disguise the fact that contracting — for software licenses or otherwise — is basically adversarial in nature.

While the SIM paper envisions a user/vendor "partnership" that is grounded in mutual understanding and trust [CW, April 19], "I'm not sure that's possible today," Acly said. "The discomfort factor is simply too high. Vendors don't feel that their business is on a comfortable basis, and why should they? We don't yet have any mechanism that assures them that they won't be taken advantage of."

No bellyaching

John Burton, president of Vienna, Va.-based Legent Corp., hailed the document as a sign of users bellying up to the task of detailing their needs rather than bellyaching about them. "For years," Burton said, "we've been saying to our customers, 'Tell us what you want,' and we've heard as many answers as we have customers. One of the best things about the SIM position paper is that it's a two-way valve."

IBM, Digital Equipment Corp. and Computer Associates International, Inc. were quick to voice support for the SIM initiative, as were a host of other software houses and industry associations, including the Software Publishers Association and the Information Technology Association of America (ITAA).

> Contracting for software licenses is basically adversarial in nature.

In fact, many of them observed, the SIM manifesto codified a relaxation of once-rigid licensing moves already under way.

Several analysts noted that, ironically, the trend was kicked into high gear by CA, the firm whose allegedly abusive contracting practices are widely viewed as spearheading the user solidarity reflected in a recent rash of position papers, including SIM's.

With the software giant in the vanguard and the winds of technological and economic change gusting at their backs, every software firm "will eventually get aboard" the licensing flexibility express, added Fred Joy, senior research analyst at Westport, Conn.-based Meta Group, Inc.

Similarly, executives from all of the software companies and organizations who spoke to *Computerworld* last week declared themselves eager candidates for the user/vendor focus group on licensing that SIM hopes to schedule within the next few months.

The desire to reach an accord, however, may not translate into success. For starters, parties on both sides of the negotiating table are still struggling simply to define the debate.

Take the SIM manifesto, said Douglas McIntyre, chief executive officer of Hyannis, Mass.-based Software 2000, Inc. and head of ITAA's quality council. "Words like 'software integration' — one of the 10 [concepts] SIM says must be included in licensing agreements — are meaningless. And what's a 'clearly defined migration path' in a world of discontinuity?"

CA offers flexibility to Perot Systems

By Thomas Hoffman
ISLANDIA, N.Y.

■ Perot Systems Corp. has signed a multiuser licensing agreement with Computer Associates International, Inc. that allows Perot — and its outsourcing clients — the flexibility of choosing between several software licensing arrangements CA offers.

The Perot agreement illustrates CA's willingness to work cooperatively with outsourcing vendors, observers said, which is especially important given the image problems that have arisen following CA's legal entanglements with Electronic Data Systems Corp. [CW, Feb. 3, 1992] and EDS clients such as National Car Rental System, Inc. [CW, April 19].

The multiuser licensing agreement calls for Perot to standardize on a broad range of CA's systems management, resource management, applications development and security packages under IBM's MVS environment. CA's planned mainframe product ports to Unix, Microsoft Corp.'s Windows 3.1 and Windows NT and IBM's OS/2 operating environments will eventually become part of the Perot agreement.

Customer applause

Perot's standardization on CA software was well-received by Volkswagen of America, Inc.'s Stephen Pickett, director of information systems. The Auburn Hills, Mich.-based carmaker, which had outsourced its computer operations and application development to Perot last May, wants to ensure that the outsourcer will continue running its operations on CA software.

"We were a heavy CA customer before outsourcing, so I view this agreement as good news since it reduces the possibility of Perot converting any of our applications to other [vendor] platforms," Pickett said.

A senior IS executive at NationsBank, which outsourced its mainframe operations to Perot in November 1991, applauded the CA/Perot agreement. "The more agreements Perot lands with software vendors, the less expense that's incurred to us. It should give us greater flexibility in outsourcing as we move forward," he said.

Stephen T. McClellan, an analyst at Merrill Lynch Global Securities in San Francisco, said the CA/Perot deal reflects a compromise between software vendors and outsourcing firms willing to meet halfway on licensing agreements.

One problem remains

CA Executive Vice President Arnold Mazur claimed EDS is the only outsourcing vendor with which CA has experienced licensing snafus. During the past few years, CA has signed agreements with outsourcers MCN Corp. and Andersen Consulting, Mazur said. The agreement with Perot differs in one important way: It allows the Reston, Va., outsourcer to resell CA's CA-Unicenter systems management package for Hewlett-Packard Co.'s HP/UX Unix environment and other Unix ports.

Perot and its clients have the option of licensing CA software three different ways. Perot clients can either continue their existing licensing agreements with CA or allow Perot to assume the licenses.

Additionally, Perot has the option of licensing CA software to run operations for multiple clients from a single data center.

Should Perot decide to invoke multiuser licensing for any of its customers, the outsourcer would not have to pay CPU upgrade fees and would be eligible for reduced maintenance fees, Mazur said.

AMD's entry into 486 market will not affect PC supply, prices much

By Michael Fitzgerald
AUSTIN, TEXAS

Users will be disappointed if they expect a PC price windfall from a judge's recent decision to grant Advanced Micro Devices, Inc. (AMD) a retrial in the 287 microcode case it lost to Intel Corp. late last year.

The retrial decision gave AMD the impetus to announce last week that it will ship its I486 clones, which it had shelved last December after losing the initial trial.

The clones are 33- and 40-MHz 486DX parts and a 25/50-MHz DX2 part. AMD is also sampling a 33/66-MHz DX2 and a 33V, 33-MHz part to ship in July.

Despite AMD's immediate entry into the 486 market, the company is not underpricing Intel much, so "we don't think it will have a significant impact on system prices this year," said Richard Zwetchkenbaum, an analyst at International Data Corp. in Framingham, Mass.

Analysts agreed with a comment by F. Thomas Dunlap, Intel's general counsel, that "the biggest impact this case has had is already over. They had parts ready to ship in December, and they didn't."

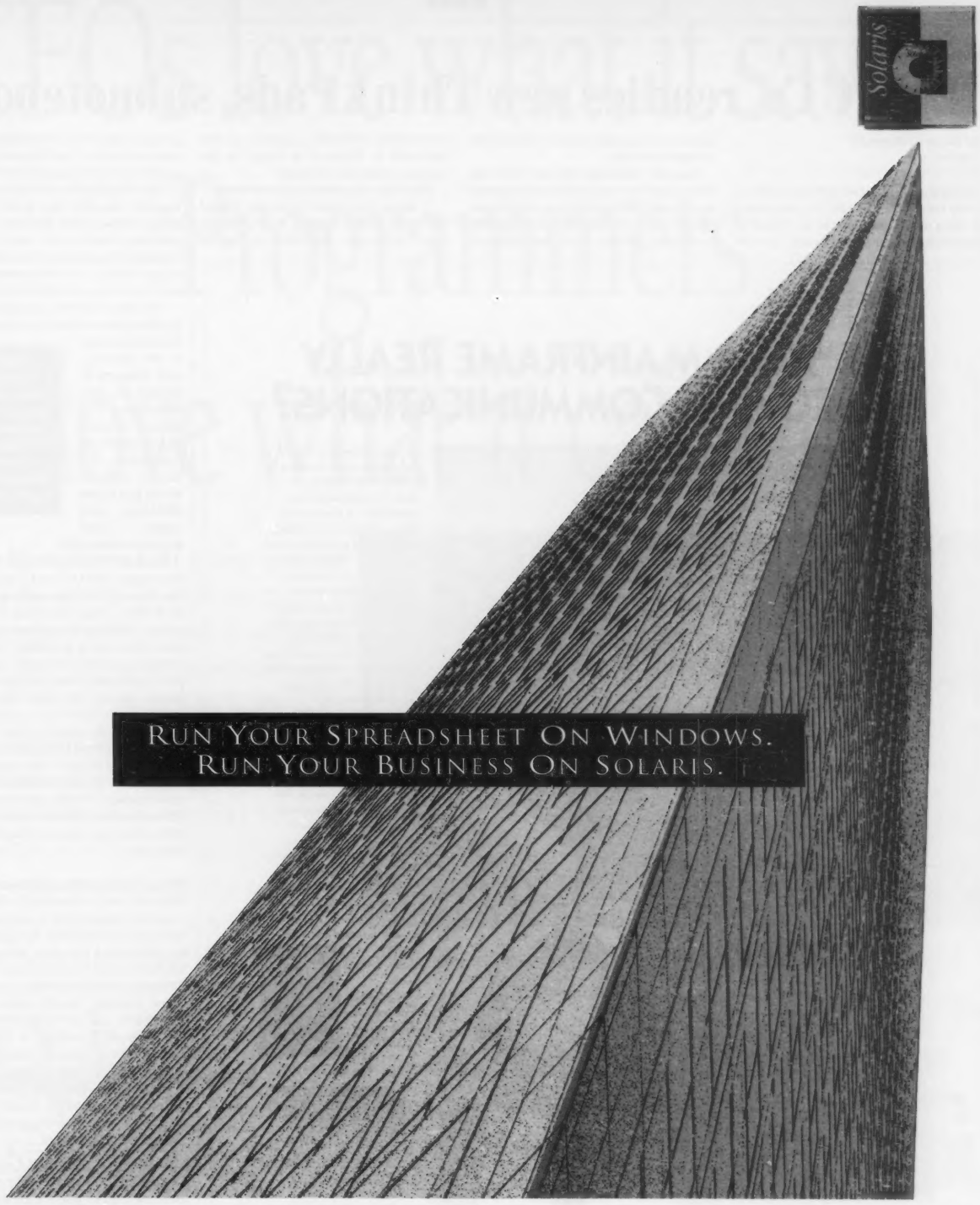
AMD also lost ramp-up time and therefore will produce less than 10,000 of its clones this quarter and only 400,000 by year's end — less than 5% of Intel's 486 production. AMD officials said they did not expect to garner even as much as 20% of the 486 market until the fourth quarter of 1994.

Production break

However, some analysts suggested that its initial legal setback may have given AMD a break on production schedules by giving the company time to work out the kinks in a new submicron development center. The three-layer metal process employed there caused slower-than-expected ramp-ups when first used by other manufacturers.

In the meantime, AMD plans to continue developing its clean-room 486 clones, which do not use Intel's microcode. AMD said it will announce these chips on July 4 and will gradually phase out 486s with Intel microcode inside them. The license that is the source of the vituperative legal disputes between the two chip makers expires in 1995, by which time all of AMD's microprocessors will have to be clean-room-developed.

The decision to ship clone chips based on Intel microcode is risky. If AMD loses again, it will be forced to give up all its profits on these chips as damages. It is likely that Intel will sue AMD for patent infringement on its clean-room 486 clones as well.



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Notebook market

IBM PC Co. readies new ThinkPads, subnotebook

By Michael Fitzgerald
SOMERS, N.Y.

Continuing its efforts to refresh products every six months, IBM PC Co. is expected to release two additions to its ThinkPad notebook line early next month, according to internal documents obtained by *Computerworld*.

The new ThinkPad 720 and 720C are redesigned versions of the existing Models 700 and 700C that feature a faster processor, better battery life and Personal Computer Memory Card International Association (PCMCIA) support. A subnotebook is expected to follow in the summer, other sources said.

IBM declined to discuss the releases.

"I would have liked to see the weight and size shrink slightly, but with the faster processor and PCMCIA, they're going to sell more ThinkPads with this announcement," said Randal Giusto, an analyst at WorkGroup Technologies, Inc.

The ThinkPad line has been a runaway success, and IBM has found itself battling a billion-dollar backlog. Having additional products may help it do that. Customers said supply has begun to loosen up recently, and they commented that the 720 products sounded attractive.

"We have to get the equipment to see, but IBM generally has made great strides in getting closer to the market," said Richard E. Nelson Jr., vice president of agency systems at New York Life Insurance Co. Nelson said he would like to see 200M-byte and larger hard drives on notebooks.

IBM will announce a new marketing program called Value Coupon Book, which features discounts on a variety of items.

The new ThinkPads come with IBM's 25/50-MHz 486SLC2 and support either two Type II PCMCIA cards or one Type III PCMCIA card. According to the documents, IBM has also added a 160M-byte hard drive and a so-called "intelligent" battery to its list of features, as well as a port replicator. The intelligent battery boosts battery life to as much as 7.75 hours on a monochrome notebook and to 4.8 hours on the color version.

IBM is expected to bring in the new 720 and 720C at close to the same current base price of $4,350 for the active-matrix color version. It was not clear whether IBM will cut prices on its existing ThinkPads, given the massive backlog on the products.

Keeping up with the Joneses

IBM will see its upcoming subnotebook — which sources said is being marketed to potential customers, though it will not be announced for some time — reach market around the same time as most of its competitors' products.

For instance, Zenith Data Systems, which has not yet shipped its Z-Lite subnotebook in volume, is expected to upgrade the product by putting in an Intel Corp. I486SL-based Z-Lite in early July, sources close to Zenith Data said.

Hewlett-Packard Co. is also expected to enter the subnotebook market in June.

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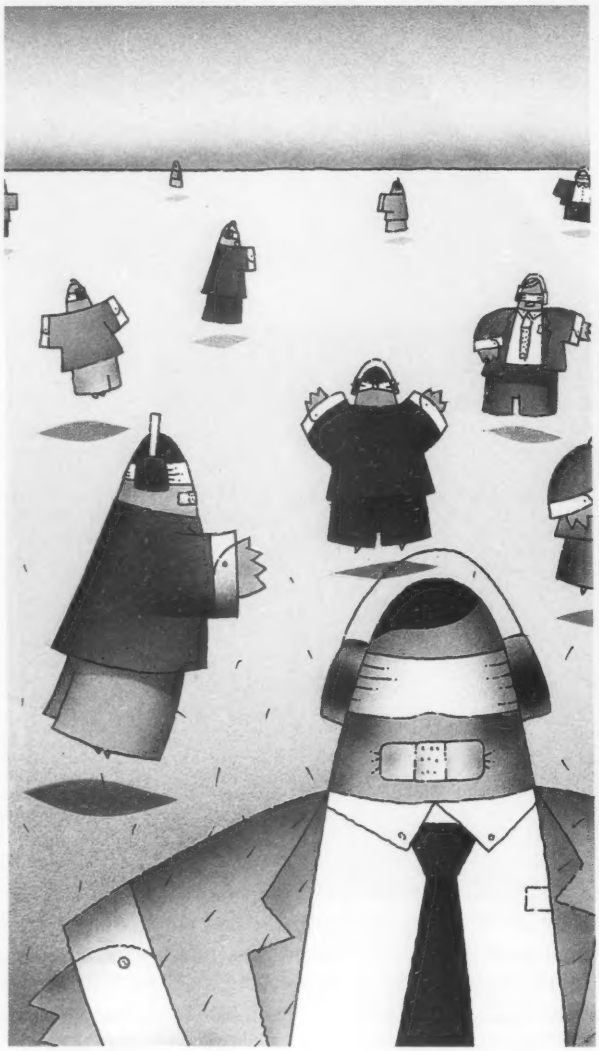

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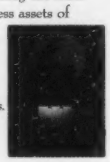

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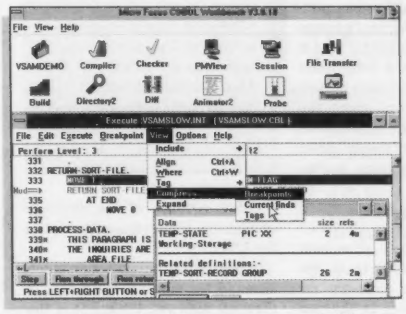

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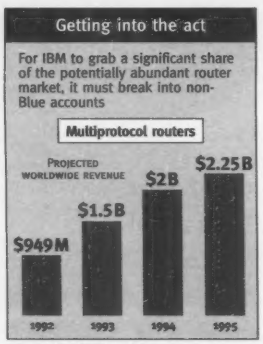
IBM details plan to boost multiprotocol router

By Joanie M. Wexler
RESEARCH TRIANGLE PARK, N.C.

IBM last week opened its internetworking kimono to reveal its short-term agenda for enriching the company's struggling entrant in the multiprotocol router arena: the 6611 Network Processor.

IBM's plans through 1994 for honing the 6611 (see itinerary at right) call for doubling its network connections, boosting performance, adding new protocol and interface support and distributing its processor architecture. These goals are sitting well with the IBM-faithful.

However, others contend that the company's 6611 itinerary represents an unimaginative, copycat strategy that does not bode well for IBM's breaking ground with fresh customer accounts — a key challenge for the "new IBM."



Source: International Data Corp.

"IBM is just not that important of a player in the LAN market," shrugged Charles W. Gerstner, systems manager at Evanston Hospital in Evanston, Ill. The facility is planning to add local-area networks to its homogeneous Systems Network Architecture (SNA)-based computing environment.

Anura Guruge, a consultant in New Ipswich, N.H., added, "The 6611's current Achilles' heel is that IBM is obsessed with playing catch-up to [market leader] Cisco."

Guruge said IBM knows how to build extremely mission-critical, reliable networks, "which in today's internetwork is an oxymoron. IBM should exploit its expertise into distributed networks. Now the 6611 looks fated to be very much a 'me, too' box that doesn't lead in anything but its graphical configuration" scheme, he said.

While observers are divided about the accuracy of IBM's self-assessed leg up in routing SNA and NetBIOS protocols — traffic notoriously uncooperative in distributed internetworks — analysts agreed that IBM has more of an image challenge to overcome than specific product problems.

IBM recently postponed delivering support for its Advanced Peer-to-Peer Networking (APPN) protocol on the 6611 from last month to the second half of this year.

While the delay is not likely to affect many network installations, "the 6611 slipping is the story of its life," Guruge said, in that aside from the 6611 being a latecomer to the router market, its initial delivery date was rescheduled twice.

"The core IBMers won't be fazed by the APPN slippage, but some potentially new customers will be turned off, as they were with the initial holdups," predicted Fred McClimans, program director of the local-area communications group at Gartner Group, Inc., a Stamford, Conn., consultancy.

IBM 6611 shops attest that the APPN delay is largely irrelevant. Brian Spears, manager of information technology at Konica Business Machines U.S.A., Inc. in Windsor, Conn., said he intends to be a heavy APPN user. And while he looks forward to the "6611 as the ideal point in the network for APPN Network Node support to simplify network design and directory structures," his company is too engrossed in getting its 48 U.S. branch sites up and running on the 6611 to notice for a while.

Still waiting

Other users voiced similar opinions, though many expressed concern that "hot swappability" — a capability emerging on competitors' routers that allows users to replace a network interface card while the device remains running — is not yet on IBM's to-do list.

"When you run multiple types of networks through the 6611 and something goes wrong with one of them, the whole internetwork is affected because you have to take the router down," explained Wayne Wilson, teleprocessing manager at Universal Underwriters Group in Overland Park, Kan.

However, the firm has been running the 6611 for about six months, and Wilson described its operation as "plenty stable."

"I would like to bring just one port down when I have to reconfigure something and not turn off the whole box," agreed David Johnson, network services coordinator at the Missouri Highway and Transportation Department in Jefferson City. "Today, unfortunately, we have to."

IBM's itinerary

Highlights of IBM's agenda for honing its 6611 router, according to Noel L. Butzke, senior product planning manager at IBM Networking Systems:

To ship May 28:
- Support for DECnet Phase IV protocols.
- The 6611 low-end Model 120 (announced at Interop '93 Spring in March).
- Data Link Switching (DLS) across Ethernet.

To ship second-half 1993:
- APPN Network Node protocol support (slipped from last month).
- Support for Banyan Systems, Inc.'s Vines, DECnet Phase V, Open Systems Interconnect protocols.
- Internet Protocol (IP) traffic prioritization; dynamic reconfiguration of IP routing.

To ship in 1994:
- SDLC enhancements, including PU2.1 support. This will allow all IBM nodes to attach to a 6611 directly, without gatewaying through a Token Ring LAN.
- Doubled number of per-adapter network connections.
- Performance boost, flow control and "Class of Servicelike" enhancements to DLS.
- Prioritization across all supported protocols.
- Visibility of the 6611 through LAN Network Manager management system; additional 6611 applications for NetView/6000 platform.
- Support of APPN+ protocol.
- Dial-up capabilities.
- FDDI modules.
- High-Speed Serial Interface for linking router to T3 lines.
- Asynchronous Transfer Mode wide-area support in the form of a channel service unit/data service unit or a full-blown switch.

AT&T eyes virtual network

CONTINUED FROM PAGE 1

dis network.

"SDN has until now been a closed network environment because it was originally designed to serve a given enterprise," Bridge explained.

The McCaw component, slated to be official by midyear, calls for direct hooks from SDN networks to cellular voice networks, Bridge said. Cellular-over-SDN services are slated to become available in the third quarter, said Glenn Starr, AT&T product director for SDN services.

"Over the next two to three years, we will be pushing our SDN customers toward being 'more virtual,' " with such efforts as mobile identification numbers, universal mailboxes and a common SDN/McCaw directory database, Starr added.

Positive force

SDN users are all for integration, but mainly from the standpoint of leveraging volume discounts and consolidating billing.

"Once you're on an SDN platform with a cellular option, you get a much better long-distance cellular rate because it looks like [calls are] being switched off the regular network," said Carl Wood, operations and communications manager at Hudson Foods, Inc. in Rogers, Ark., and a member of the SDN Users Technical Advisory Committee.

Also, "the more products the SDN network can carry — voice, cellular, whatever — the bigger the advantage to customers who have committed to SDN," Wood said. This is because SDN customers contract for a certain number of minutes on SDN with price based on volume.

Similarly, the importance of SDN getting access to wireless networks "represents more of a financial advantage in billing," said a network planner at a large East Coast health care products maker. "Once wireless comes under the SDN umbrella, it counts toward the aggregate, so it is cheaper" than buying separate services, he explained.

"Customers want integrated cellular and mail access to SDN," affirmed Danny Briere, president of TeleChoice. "AT&T truly got ahold of a unique industry resource [with McCaw], in that no other nationwide cellular company has such a wide coverage area," he said.

Wireless possibilities

While wireless links to SDN are "very important because many emerging applications, particularly for the sales force, have wireless possibilities, our main push with SDN has been to make it more integrated with other AT&T services," said Jay Ritterskamp, director of telecommunications at Monsanto Co. in St. Louis. "We want a larger menu to pick from and more cohesive management with SDN."

Strategy in a nutshell

The following are key components of AT&T's virtual enterprise strategy:

- AT&T's existing SDN. It allows customers to "rent" chunks of the public network at the guaranteed speeds they would get with a private network, while paying for bandwidth only when they use it and sidestepping hefty equipment investments.
- Buying one-third of McCaw to link wireless voice communications into SDN. McCaw has the most far-reaching wireless service coverage to date.
- The merging of AT&T's wired EasyLink messaging, telex and fax service with SDN so that companies not of Tariff 12 stature can also buy "packages" of services, leverage volume discounts and receive integrated bills.
- The acquisition of NCR Corp. for provision of video/multimedia services and broad network management.
- Relationships with providers of wireless packet data networks, such as the RAM Mobile Data and the Motorola/IBM Ardis networks.

—Joanie M. Wexler

Other reviews of the strategy emphasize the business potential for AT&T.

"I personally haven't seen much demand for wireless data access through SDN yet, though it is the next logical step," said Berge Ayvazian, senior vice president of communications at The Yankee Group, a Boston consultancy. "I think a stronger force at play is AT&T's desire to cross-sell lots of EasyLink" and other strategic, integrated products.

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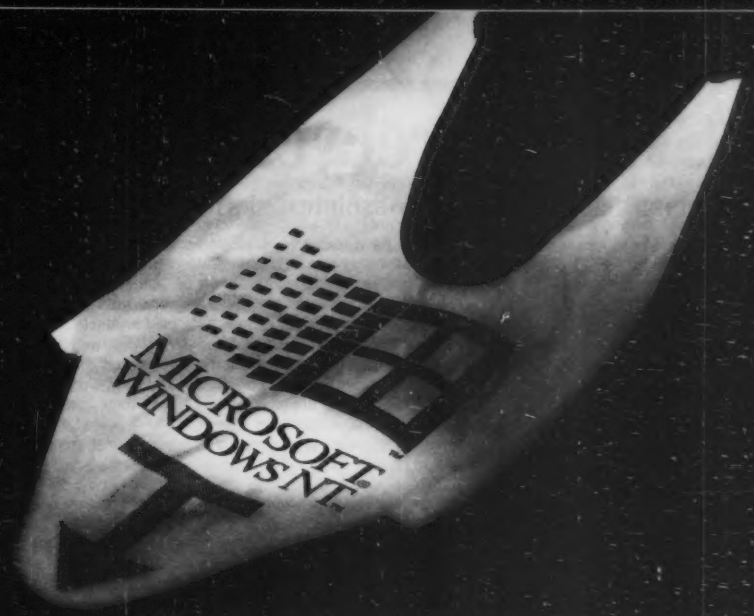

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Start-up recycles floppies

GreenDisk Co. reformats obsolete disks for resale at lower cost

By James Daly
REDMOND, WASH.

Being a "green" member of the computer industry has not always meant that you conducted your business in an environmentally responsible way. More often you were just rolling in money.

That perception is starting to change, however, as last week's annual Earth Day celebration pointed out. While vendors such as Texas Instruments, Inc. and Apple Computer, Inc. reavowed their support for the Environmental Protection Agency's Energy Star program (see story at right), a newcomer from the Northwest is taking environmental activism one step further.

The start-up, GreenDisk Co., is recycling some of the mountains of used floppy disks that would otherwise end up in landfills. GreenDisk has targeted a very sensitive part of end users' anatomy: their wallets. For a "gently used" floppy, users pay approximately $4.50 for a box of 10 disks vs. $5.50 or more for brand-new floppies.

According to GreenDisk founder David Beschen, software manufacturers annually throw out hundreds of thousands of packages that are in the sales channels when updates arrive. Some are sold at discount, but most are returned for updated versions. The result is heavy disposal costs. "Basically, I'm getting rid of their trash," Beschen said.

Beschen's plan is to gather the obsolete disks, demagnetize and reformat them and then resell the freshly cleaned media at a fraction of the cost of new floppies. Because the disks have been written to only once but have passed quality control as many as three times, the resulting product is of excellent quality, he said. And nearly 95% of the software packaging material is also reclaimed.

GreenDisk has already received and is in the process of preparing more than 750,000 disks from companies such as Autodesk, Inc. and Central Point Software.

Ecological appeal

GreenDisk's appeal is to end users — especially those who are already ecologically conscious. "In a society where everything is instantly disposable, recycling makes me feel very good," said Nancy Wong, manager of computer operations at Pacific Gas & Electric Co. (PG&E) in San Francisco. PG&E has already built some very aggressive paper recycling programs in-house, so using recycled software "would be very much in line with what we've been doing," Wong said.

Others said they look more favorably on companies using recycled products. "It says something very positive about a company to show that they can act responsibly," said Trey Thompson, a systems analyst at Citgo Petroleum Corp. in Tulsa, Okla.

Beschen said GreenDisk will keep millions of cubic feet of recyclable materials out of landfills —while turning a tidy profit. "For every 100,000 packages we recycle, we can reduce landfill from what could be up to 50,000 cubic feet down to less than 50 cubic feet," Beschen said. He said they have even found uses for the tyvek disk holders that were previously considered unrecyclable.

Analysts said the symbiotic monetary relationship between software manufacturers and GreenDisk could make the effort click.

"Like many industries, the computer industry is still reactive when it comes to the environment; sometimes they need a little push," said Lenny Siegel, director of the Pacific Studies Center, a public interest information center in Mountain View, Calif. "But a chance to save a little money can be a very convincing little push."

We are the world

Last week's celebration of Earth Day offered an opportunity to reflect on the information technology industry's environmentally sound and sorry practices.

Green kudos

- The EPA's Energy Star program has enlisted a slew of manufacturers committed to building energy-efficient computers and laser printers, including Hewlett-Packard Co., Compaq Computer Corp., Unisys Corp., Digital Equipment Corp., Intel Corp. and NCR.
- IBM's San Jose, Calif., manufacturing facility ended its use of chlorofluorocarbons (CFC) more than a year ahead of schedule and five years after the site was declared the country's worst CFC emitter.
- The chemical coating of fax paper prevents it from being completely recycled. Partially recycled thermal fax paper, however, is made by TechRite Unlimited in Marblehead, Mass. And it promises to match the price of paper made from virgin pulp.

Green barbs

- Microsoft Corp. has launched an alarmingly wasteful 10th anniversary celebration of its Word application by mailing thousands of instantly disposable heavy-duty folders, each devoted to the news of a single year of Word's decade-long run.
- The Silicon Valley remains one of the biggest Super-Fund toxic cleanup sites in the country. The worst offenders: semiconductor companies.
- Laser printers and photocopiers gobble up the equivalent of about 238 million trees a year, according to estimates from the Conservatree Paper Co., a San Francisco-based recycled paper distributor.
- The energy drain caused by PCs that are always on is becoming substantial. According to the EPA, PCs consume more than 5% of the commercial electricity output in the U.S.

Compiled by West Coast senior correspondent James Daly.

EDI cure

CONTINUED FROM PAGE 1

American National Standards Institute's X.12 EDI interface standard to process claims.

Spearheading the health care industry effort is the Workgroup for Electronic Data Interchange (WEDI), a coalition of government and private health care organizations created under the Bush administration.

The WEDI proposal calls for the largest payers and providers to be EDI-compliant by the end of 1994 and the remainder to be compliant by the end of 1995.

At the Electronic Data Interchange conference held here recently, WEDI co-chairman Joseph Brophy said the group proposed that the president's task force include expanded use of X.12-based EDI in its recommendations.

"My estimate is that we can probably save using EDI $35 [billion] to $50 billion [annually]," said Brophy, who recently retired from his post as president of Travelers Insurance Co. However, the real payoff "is that we are going to have good information to make better decisions that will lead to better health."

Healthy choices

Other WEDI recommendations:

- **Uniform, nationwide** indentifiers for patients, providers, payers and employers.
- **Interconnected EDI** networks.
- **A national** clearinghouse to accredit EDI programs.
- **A 15-day payment** ceiling for electronically submitted claims.
- **Confidentiality** in electronic transmissions.
- **Small business loans** for EDI development.
- **Small health care** software vendor financing.

Savings will come from reduced manpower needed to rekey information, increased accuracy, less fraud due to better data tracking and reduced postage costs, according to Lee Barrett, assistant vice president of Aetna Life and Casualty Co. and a WEDI member.

Craig Castro, vice president and chief information officer of St. Agnes Medical Center in Fresno, Calif., said he supports the WEDI proposal. The hospital currently uses proprietary EDI. However, "if we could move to standard claims forms and an electronic method to submit and remit claims, that would significantly reduce our administrative costs," he said.

Although EDI already has a presence in the health care industry, 60% to 70% of EDI users print and rekey information because they are using nonstandard forms and proprietary, unintegrated technologies, according to Rachel Foerster, EDI services market manager at Baxter Healthcare Corp., a distributor of health care supplies in Deerfield, Ill. The WEDI proposal would resolve this issue by mandating a standard form and supporting integrated EDI.

Many users agreed bigger savings will come from processing claims using EDI and said a government push can make it happen.

Although there will be long-term savings, hospitals hit by hard economic times have had trouble digging up money to cover EDI start-up costs. A government mandate would help many get started, said Judy Anderson at the Hospital Council of Southern California.

For example, the University of Texas Medical Branch at Galveston is making plans for X.12 EDI, but costs are an impediment. The medical center must consider the costs of additional communications hardware, leased phone lines, translation software and in-house programming to interface data systems to the translation software before moving to EDI, said Bobby Medina, programmer and analyst. However, he said he expects the move to happen in one to three years because of longer term costs savings.

Major suppliers, such as Baxter, are also supporting increased use of standards-based EDI. Baxter, an EDI user since the late 1970s, has seen a shift toward X.12-based EDI among its 4,000 hospital trading partners, according to Daniel Browning, director of EDI. This shift will prepare hospitals to use X.12 for claims processing in compliance with the WEDI recommendations, Browning said.

Whether Clinton's task force accepts the WEDI proposals will become clear next month, when the tight-lipped committee is expected to make its recommendations public. But health care participants contacted were certain the industry will move the bulk of its claims processing to EDI.

While EDI will help the health care industry save money, it is only one piece of the computerization puzzle, said John Page, executive director of the Healthcare Information and Management Systems Society in Chicago.

"I think the big bang will come from good clinical systems," Page said. For example, computer-based patient records will help doctors in different clinics know what tests a patient has received.

Windows NT apps

CONTINUED FROM PAGE 1

The imminent arrival of NT has not spurred Microsoft to accelerate its plans to deliver 32-bit versions of its desktop software, which will run on Windows NT and the coming version of Windows 4.0 due out early next year [CW, April 19].

Microsoft declined to say which applications it will deliver for Windows NT this year, but it has been demonstrating a 32-bit version of Excel, said Microsoft Senior Vice President Pete Higgins.

Windows NT will pretty much mirror OS/2's track.

In the meantime, WordPerfect Corp. said it has no plans to deliver a 32-bit version of its word processing software for graphical environments until the end of the year, and Lotus Development Corp. is evaluating whether it will port its application software to Windows NT. "We see NT as a server platform for Notes, but we're not sure that its current size of 16M bytes will make it a high-volume client," a Lotus spokesman said.

"Microsoft only expects to ship about one million NT units in the first year, which is about what Windows currently does in a month," Donovan noted.

At that pace, Windows NT will pretty much mirror the track taken by IBM's OS/2, which has been deployed mostly as a server and custom application platform at large information systems sites.

In the meantime, users are forging ahead with custom applications and server implementations for Windows NT. Thus far, more than 60 application development tools have become available. Microsoft intends to deliver Visual C++ for NT 90 days after NT's launch.

"We are going to deploy NT for an in-house proprietary application as soon as it's stable," said Tom Daly, manager of trading systems at the Midwest Stock Exchange in Chicago.

As for desktop applications, he said, the exchange will either run them in 16-bit mode under Windows NT or maintain existing PC systems to run them.

Other customers said they see Windows NT as a natural extension to OS/2 because NT was derived from the work IBM and Microsoft had been doing their alliance in 1990.

"We see NT as Version 3.0 of OS/2 that was promised before the Microsoft alliance with IBM broke up," said William Wilson III, vice president at Johnson & Higgins in New York. The insurance brokerage plans to start migrating its Notes environment to NT by year's end.

On the third-party vendor side, among the applications that should be available with the arrival of Windows NT are business reporting tools from IMRS, Inc. in Stamford, Conn., and document publishing software from Frame Technology Corp. in San Jose, Calif.

IMRS intends to support NT on both Intel Corp. platforms and DEC's Alpha AXP; Frame Technology will confine its initial effort to support Intel platforms.

"We see NT really starting to happen in 1994 when the engineering applications that are now on Unix and VMS are available for NT," said Siva Kumar, vice president of marketing at Frame Technology. "NT provides a good compromise for end-user needs for Windows and IS needs for a robust operating system."

IMRS' decision to support Alpha AXP platforms in addition to Intel hardware is driven by DEC's large installed base for accounting software. IMRS has yet to see a PC system based on Intel's Pentium processor, but IMRS tests show that 10M to 12M bytes of floating point data takes 58 seconds to execute on 16-bit Windows 3.1 running on a 50-MHz Intel I486 platform, compared with 17 seconds using an NT operating system on the same Intel hardware, said Dave Morehead, IMRS' director of research.

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News Shorts

Doing even more time?

Kevin Poulsen, a notorious computer hacker already in jail awaiting trial on federal charges, was last week charged with using computers to rig promotional contests at three Los Angeles radio stations in a scheme that netted two Porsches, two trips to Hawaii and $20,000 in cash. Poulsen and two other hackers were allegedly able to seize control of the phone lines so that only their calls could get through. He was also charged with illegally hacking into computers owned by the **California Department of Motor Vehicles** and **Pacific Bell** to obtain information about undercover businesses and wiretaps run by the **FBI**, according to the 19-count indictment.

Bedrock takes shape

Symantec Corp. plans to add **Rational**'s C++ Booch Components to Bedrock, an object-oriented development framework being built by Symantec and **Apple Computer, Inc.** The Rational product is a class library designed to help programmers build and manage object-based applications quickly with reusable pieces. The first release of Bedrock, aimed at software developers, is due out late this year.

AT&T inks big deals

AT&T last week said it has signed $60 million worth of network service contracts with **America West Airlines, Ashland Oil, Inc.** and **Oracle Corp.** Ashland and Oracle have inked multiyear deals for AT&T's Software Defined Network, a set of "virtual" private services (see story page 1), and America West and Ashland have contracted for 800 voice services.

WordPerfect outsources some support

WordPerfect Corp. last week announced that it will outsource some of its service and support responsibilities to **National TechTeam, Inc.** in Dearborn, Mich. Some of the support calls concerning releases of WordPerfect prior to 5.2 will now be routed to National TechTeam via the same standard WordPerfect support numbers. WordPerfect Chairman Alan Ashton has previously noted that as support calls become more complex, particularly in an era of networked applications, users can expect WordPerfect to outsource more support functions.

Sun expands ISDN line

Sun Microsystems Computer Corp. extended its Integrated Services Digital Network (ISDN) offerings last week: A $95 single-user license or a $495 100-user license for the SunLink ISDN-Basic Rate Interface Enabling Kit buys software that sends Transmission Control Protocol/Internet Protocol applications across public ISDN networks; it is for use with Sun SPARCstations that are equipped with ISDN functions and capabilities.

SHORT TAKES **3Com Corp.** and start-up **Cascade Communications Corp.** said they will jointly market 3Com's routers and Cascade's frame-relay feeder switches and will co-develop interoperable network management, congestion control schemes and frame relay.... **Informix Software, Inc.** announced first-quarter revenue of $77 million, up 43% over the first quarter of 1992; quarterly profits for the database vendor were $11.5 million.... The **Software Publishers Association** has begun distributing to law enforcement officers a 150-page manual of software copyright regulations.... **Ungermann-Bass, Inc.** said it will ship late this quarter a smaller (eight-port) version of the 16-port DragonSwitch Ethernet switching hub it announced in February. The 16-port version is expected to ship in the third quarter.

Workstations

Sun boosts SPARCstation 10 line

By Stephen P. Klett Jr.
BOSTON

In a move to boost sagging credibility caused by delays in product ship dates and below-par uniprocessor performance levels, Sun Microsystems Computer Corp. (SMCC) last week announced several additions to its SPARCstation 10 line of workstations.

The Sun Microsystems, Inc. subsidiary unveiled four new models, new price points for several machines and volume shipment of the SuperSPARC CPU.

The new models, which all begin shipping next month, range from the Model 30LC, an entry-level, multiprocessing-capable machine, to the high-end Model 51 (see chart). Sun claimed that users could expect 10% to 20% gains in performance by running their existing applications — without modification — on the multiprocessing machines.

Seeking a spark

SUN'S ADDITIONS TO ITS SPARCSTATION 10 LINE SHOULD APPEAL TO PRICE-CONSCIOUS USERS. TWO EXAMPLES:

Specifications	Model/30LC*	Model/51*
SPECint92	45.2	65.2
SPECfp92	54.0	83.0
MIPS/MFLOPS	101.6/20.5	135.5/27.3
Main memory	32M-512M bytes	64M-512M bytes
Disk capacity	424M to 41G bytes (SCSI)	1G to 41G bytes (SCSI)
Base price	$15,995	$26,745

* Uniprocessor/multiprocessor-ready systems

CW Chart: Nancy Kowal

While analysts agreed that the multiprocessing power of the SPARCstation 10 machines would improve the performance of most applications, some were skeptical of customers' need for dual processors on the desktop at this time.

Tom Kucharvy, president of Summit Strategies in Boston, said, "Multiprocessing certainly has its advantages if the need is there to run several apps at once. However, right now you can achieve the same effect with a powerful server and an inexpensive network of workstations, such as [Silicon Graphics, Inc.] is doing."

On target

Industry observers said Sun still needs to boost uniprocessor performance, but they believe it is taking a timely step in the right direction.

George Weiss, vice president of computing services at market research firm Gartner Group, Inc. in Stamford, Conn., said, "This is a good move for Sun, considering the limitations it was under," which included delays in the delivery of the SuperSPARC chips and Solaris 2.2, the latest version of Sun's operating system. "It will help recoup some of the credibility Sun has lost in the market," he added.

Despite misgivings, for their part, users were upbeat in their response to the announcements and said plans to move to multiprocessing were in the works.

Dan Minior, MIS director at Pratt & Whitney in East Hartford, Conn., which has approximately 2,000 Sun workstations spread throughout its operations, said the capabilities of the 50-MHz machines are "very attractive." He said the company will move to the multiprocessing machines within a year, and he does not foresee any problems with the transition.

Mark Factor, MIS director at Boston-based Au Bon Pain, Inc., a chain of bakery cafes, said he purchased a SPARCstation 10 Model 41 in January to replace an overburdened SPARCstation 2. With company growth of 40% a year, Factor said, the SPARC 2 could not keep up. The Model 41, which is currently running as a single-processor machine, "has cut processing time by one-third and is really working out well for us."

Factor said he plans to add a second processor by the early part of next year, depending on the company's growth rate.

SMCC announced volume shipment of its SuperSPARC chip and took the wraps off its next-generation SuperSPARC processor, the 50-MHz SuperSPARC+. Manufactured by Houston-based Texas Instruments, Inc., the SuperSPARC+ is also shipping in volume and is rated at 65 to 68 SPECint92 and 80 to 85 SPECfp92. TI officials said they had ramped up chip production to produce 100,000 SuperSPARC chips per quarter.

The 50-MHz chips are available as plug-compatible upgrade modules for the SPARCstation 10 line starting at $4,000.

Also announced were the Model 40, which has a single 40-MHz processor and starts at $19,745, and the Model 402MP, which comes with dual 40-MHz processors and starts at $23,745.

SMCC also updated its yet-to-ship Model 52, which it unveiled in November. The $33,745 dual-processor machine, renamed the Model 512MP, will now include the SuperSPARC+ rather than the 45-MHz CPUs previously specified. Sun also cut the price of its mid-range Model 41 uniprocessor machine 18% to $21,745.

First PowerPC chips ship

By Michael Fitzgerald
AUSTIN, TEXAS

Motorola, Inc. will today begin shipping the first member of its PowerPC family, heralding the beginning of what may be the most serious challenge to Intel Corp.'s lock on the processor market.

Motorola struck an aggressive pricing stance with the MPC601 processor, the first of four announced PowerPC processors designed with IBM. The 601 will be available at 50- and 66-MHz speeds and will sell for $280 and $374, respectively, in lots of 20,000 units.

By contrast, Intel's 33/66-MHz I486DX2 sells for $542, and even 33-MHz and 40-MHz 486 clones from Advanced Micro Devices, Inc. will sell for $306 and $417, respectively, in lots of 1,000.

"If I were Intel, [PowerPC] would be highest on my list of products I don't want to have on the market," said Dean McCarron, an analyst at MicroDesign Resources, a Scottsdale, Ariz., market research firm. "Realistically, this is the most viable architecture next to the X86."

Part of the reason for this is that the two largest vendors in the industry, IBM and Apple Computer, Inc., are committed to the architecture. This gives the PowerPC a shot at generating enough volume to attract software developers. PowerPC hardware is supported by IBM's AIX and OS/2, Apple's System 7, and Solaris from Sun Microsystems, Inc.

Motorola's Dave Mothersole, director of engineering at the RISC Microprocessor Division, said the company is aggressively pursuing other operating system vendors, including Microsoft Corp. Many analysts said they expect Microsoft to port NT to PowerPC.

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Network management

Cabletron SNA manager delayed

By Elisabeth Horwitt
ROCHESTER, N.H.

Cabletron Systems, Inc. will be a few months late delivering software said to provide integrated management of IBM Systems Network Architecture (SNA) and multivendor local-area network and internetworking installations.

The company is holding off delivering Spectrum/BlueVision until it can also ship Version 2.0 of Spectrum, its Simple Network Management Protocol-based network management system.

Cabletron is still collecting feedback from beta-test sites. Indeed, one site said it has yet to get its implementation up and running.

Version 2.0 enables Spectrum to run for the first time on an IBM RISC System/6000 platform, which is also the initial platform for BlueVision.

Announced last fall and originally slated for general availability in March, Spectrum/BlueVision is now due in June, a Cabletron spokesman said.

Co-developed by Cabletron and NetTech, Inc., BlueVision is said to allow Spectrum and IBM's NetView to exchange key alerts and other information about the network installations they are managing. Spectrum users will be able to monitor an SNA network from the familiar Spectrum graphical user interface, while NetView users can monitor the status of the LAN hubs, cards and internetworking devices that Spectrum manages, the vendor said.

Any way you look at it

"It's what we've been looking for: to look at our SNA network elements the same way we look at everything else on Spectrum," said John Scoggin, supervisor of network operations at Delmarva Power & Light Co., which is beta-testing the product.

Delmarva Power is still working with IBM, Cabletron and other assorted vendors to get BlueVision up and running, Scoggin said. The delays are not due to the system itself. Rather, they stem from Scoggin's unwillingness to pay $8,000 to upgrade an old 3174 Token Ring controller with microcode that would enable it to handle IBM LU6.2 traffic. BlueVision uses LU6.2 as the pipeline for passing network management data between an IBM NetView host and Spectrum on an RS/6000. The company is now trying to accomplish this through Ethernet and McData Corp.'s new 6200 controller, he added.

Version 2.0 enables Spectrum to run for the first time on an IBM RISC System/6000 platform, which is also the initial platform for BlueVision.

With Version 2.0, Spectrum will run on Sun Microsystems, Inc.'s Solaris, Digital Equipment Corp.'s Ultrix and IBM's AIX systems for the first time, the Cabletron spokesman said. Currently, Spectrum runs on Sun's SunOS and Silicon Graphics, Inc. systems.

Among the other enhancements slated for Version 2.0 are improved performance in collecting and processing network management data and an enhanced ability to discover and map nonstandard network devices, the spokesman said.

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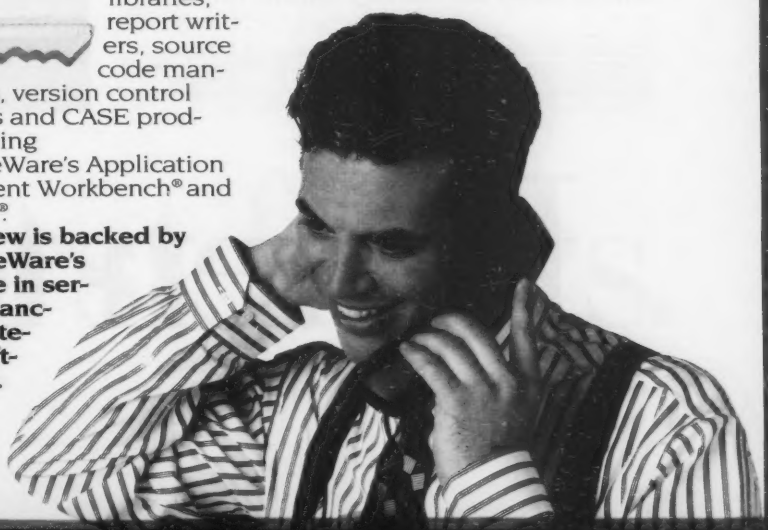

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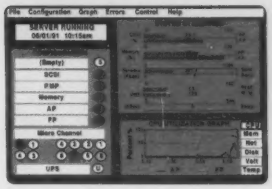
It even tolerates

and recovery capabilities. MASS/2 works with a battery backed-up Remote Maintenance Processor (RMP) option that can notify you of errors, failures, corrective action taken—even provide system access during a power failure. And you can extend fault tolerance to the entire disk subsystem by adding an Orthogonal RAID-5 Disk Array/2.



The MASS/2 option has a user-friendly GUI that lets you distribute computing power across your organization from a central location.

Server 195/295 Comparison

Feature	Server 195	Server 295 Model 1	Server 295 Model 2
Remote Maintenance Processing and Modem	optional	standard	standard
Processors	486/50 MHz	MP-486/33 & 50 MHz	MP-2 486/50 MHz
Available Slots	8 Micro Channel®	12 Micro Channel	12 Micro Channel
MASS/2	optional	standard	standard

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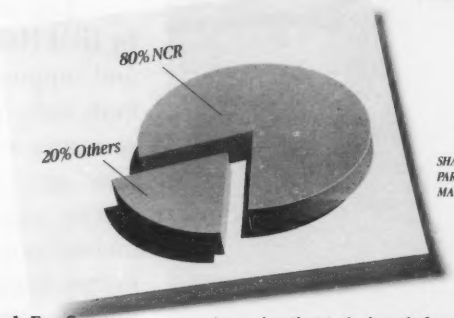

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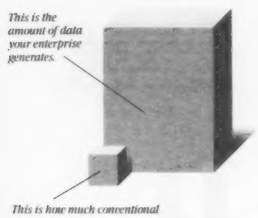

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Banyan to add platform, tool kit for Vines

By Michele Dostert
SAN FRANCISCO

Keeping with tradition, Banyan Systems, Inc. will kick off its user conference this week with moves that will generally please its loyal user base but are unlikely to woo throngs of new customers.

At the Association for Banyan Users International meeting here, the company will add Hewlett-Packard Co.'s Precision Architecture-RISC workstation to its stable of server platforms. It will also roll out a developer's tool kit to accelerate use of the recently released, well-received Version 5.5 of its Vines network operating system, a Banyan spokeswoman confirmed. No projected release dates have been announced.

The PA-RISC server version will expand Banyan's presence in the "open" Unix market, where it staked a claim last fall by porting Vines to The Santa Cruz Operation's Unix. Vines servers have historically been Unix kernel-based but modified to the degree that they were considered proprietary.

"Since Banyan is targeting the high-end corporate network marketplace, RISC machines are a natural move for them," said Stan Schatt, director of network services at Computer Intelligence/Infocorp in Santa Clara, Calif.

New addition

Banyan released Vines Version 5.5 in January. It combines Apple Computer, Inc. Macintosh support of Vines 5.0, the broad device support found in Vines 4.X series and enhancements in directory services, file systems and intelligent messaging in one product.

Vines 5.5 has been uniformly praised by early adopters, most of whom plan to migrate their entire systems to it.

Although Banyan has only 8% of the overall local-area network market, it has more than 26% market share in LANs with more than 35 users, according to Dataquest, Inc. Nonetheless, industry watchers believe that the company's window of opportunity for market share expansion in the fast-growing application server arena has largely passed.

"I think third-party application vendors will be very busy writing to Microsoft Corp.'s NT, IBM's OS/2, Novell, Inc.'s UnixWare and NetWare and Sun's Solaris. Writing to the Banyan platform will come way down the list, which will hurt Banyan," Schatt said.

"The intelligent messaging alone is enough to make us upgrade," said Cathy Graham, manager of technical services at Cooperative American Physicians in Los Angeles.

Yvette Fleming, a network administrator at National Medical Enterprises in Santa Monica, Calif., said she was impressed by Vines 5.5's remote server control. "Now I can fix a problem at a remote site without having to get in my car and drive over there," she said.

Eric Dickstein, a lead development analyst at Continental Grain Corp. in New York, was enthusiastic about new administrative capabilities, better printer support and the support of object attributes in the Vines 5.5 directory service.

"We're definitely going to upgrade, but it's a major change with no road back, so we'll wait until our third-party vendors for such products as mail gateways and remote access programs release Vines 5.5 versions," he said.

Users expressed concerns over minor bugs in the Version 5.5 file system and printing routines, but Banyan fixed the bugs in a "maintenance" release that will ship shortly, said Pam Campagna, Banyan's product manager for Vines 5.5.

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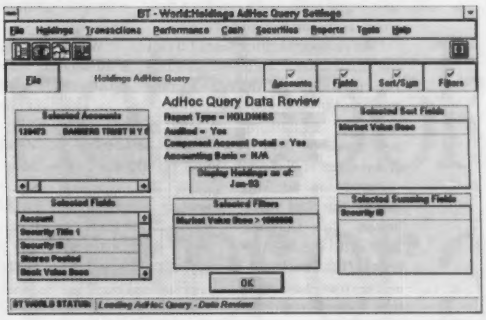

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Tech Talk

Distributed map

In advance of next month's Challenge '93 showcase in Boston, the Open Software Foundation (OSF), in collaboration with the University of Michigan's Center for Information Technology Integration, has developed a geographic information system for a world map. The system, which uses the OSF's Distributed Computing Environment (DCE) standard, allows users to zoom in and out of the map. Queries are made through the system's Motif user interface, which retrieves information from different DCE servers.

Full-motion MPEG chip

At Comdex/Spring '93 in Atlanta next month, Audio DigitalImaging, Inc. (ADI) will unveil a chip that is able to encode and decode real-time, full-motion video. The MPEG I chip, dubbed Apogee I, uses a parallel processor that encodes and decodes up to 30 frames per second. This Application Specific Integrated Chip complies with the MPEG I standard but adds proprietary enhancements for functions such as digital special effects. ADI expects to have its product ready to ship in July. According to Will Strauss at Forward Concepts Co. in Tempe, Ariz., the market for video encode/decode chips of all types is doubling each year and is now worth about $23 million.

Like magic. . . .

"Principles, techniques and ethics of stage magic and their potential application to human interface design" is the title of one of the technical sessions at this week's Interchi '93 in Amsterdam. An international forum for discussion of human/machine interface technology and research, Interchi '93 is jointly sponsored by the Association for Computing Machinery's Special Interest Group on Computer and Human Interaction in New York and the International Federation of Information Processors in Geneva.

E-mail meets voice mail

You may soon be able to *read* your phone-mail messages

By Ellis Booker

Pervasive but far from perfect, voice-processing technology is now largely the province of multibutton office telephones.

That is about to change, however, as vendors of voice-mail and voice-response systems scramble to integrate their products with client/server computer networks.

What this evolution will mean for office workers in the near future is this: Instead of an electronic-mail system accessed via a desktop computer and a voice-mail system associated with the telephone, users will be able to look at a single screen detailing the contents of their mail, both electronic and voice, or route compressed voice messages around a local-area network using the E-mail network.

"We're approaching what I'll call the third wave," said Don Van Doren, president of Vanguard Communications Corp., an industry consulting and research firm in Morris Plains, N.J.

According to Van Doren, the first wave began in October 1980, with the deployment of the first large-scale voice-mail system. Voice-response systems date from the early 1970s.

Next came integration with telephones and the private branch exchanges. "Now the move is right to the desktop . . . making these systems LAN-able," Van Doren said.

Van Doren and others pointed out that the migration of voice services to the desktop has been enabled by the added power in those desktop machines. "As we get more [Digital Signal Processor]-equipped PCs and PCs with sound capabilities, there will be an explosion in this market," Van Doren said.

The addition of voice to the LAN inevitably raises the question of network congestion.

However, this issue does not worry Henry Hyde-Thomson. Hyde-Thomson is founder of The Vmail Co., a London-based company specializing in LAN-based voice processing that was acquired earlier this month by San Jose, Calif.-based VMX, Inc., which wanted to establish a client/server software division.

"With our compression scheme, a 10-second voice message takes up about 30K; a 30-second message is around 100K," he said. For storage, Vmail recommends a 50% addition to the space currently allocated to E-mail mailboxes.

Still problems

While screen-based voice-processing systems may add convenience, they will not, by themselves, eliminate all the complaints about voice-processing technology.

"The complaints about voice mail rarely come from the users; they generally come from the callers," said Paul Stockford, a principal analyst at market research firm Dataquest, Inc. in San Jose, Calif.

The trouble, Stockford said, comes either from abuse (principally users who "hide" behind voice mail and do not return calls) or because of a poor implementation of the system (too many choices in a menu, an endless loop or no convenient way to escape back to a live operator).

Nevertheless, integration at the desktop over the LAN will mean incoming voice messages that arrive from other users on the LAN can be screened according to their time of recording, length and source. Unfortunately, the source of messages coming from locations off the LAN will not be identifiable, unless the phone call provides (and the messaging application accepts) automatic number identification (ANI) signaling from the phone network.

Once the ANI is captured, a local database can be checked for an associated name, which can then be added to the header field of a message-alert screen.

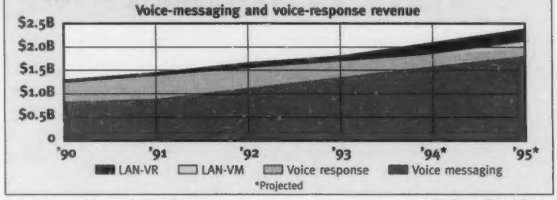
The ANI solution, of course, only identifies the calling phone, not the caller. To address this issue, some people in the voice-processing industry advocate the development of a communications ID number that would be unique to each caller.

Ultimately, speech-to-text technology will connect the voice-mail and E-mail realms, but analysts said they are not hopeful that this solution will become a commercial reality for three to five years.

On the other hand, there are text-to-speech systems that can read portions of E-mail messages to users on the road who wish to check their E-mail and do not have laptop computers with them.

Voices carry

LAN-based voice-messaging and voice-response systems currently account for only a sliver of the market



Source: Vanguard Communications Corp. CW Chart: Michael Siggins

Voice-processing vendors

Here is a short list of vendors in the voice-processing market that have already implemented client/server approaches:

- **Active Voice Corp.**, Seattle
- **Applied Voice Technology, Inc.**, Kirkland, Wash.
- **Centigram Corp.**, San Jose, Calif.
- **VMX, Inc.**, San Jose, Calif., which this month acquired The Vmail Co., a London-based vendor specializing in LAN-based software.

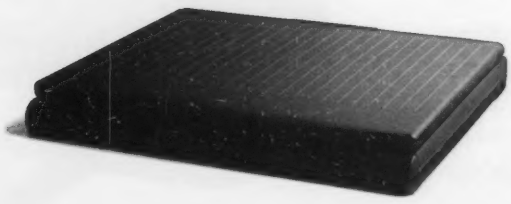
Systems vendors, too, are plumbing the market, generically known as Computer Telephone Integration:

- **IBM** offers its Call Path Services Architecture.
- **Digital Equipment Corp.** has its Computer Integrated Telephony product line.

Calling in the standards

▶The Audio Messaging Interexchange Specification (AMIS), a vendor/user group formed in 1987, currently has a formalized analog specification; its digital standard is still being refined. The Voice Mail User Interface Forum, formed in 1990, is working on a standardized interface for voice-processing systems. Its work is not as far along as that of the AMIS interexchange group.

After all the thinking we put into it, we still can't say whether it's a notebook computer or a desktop computer.



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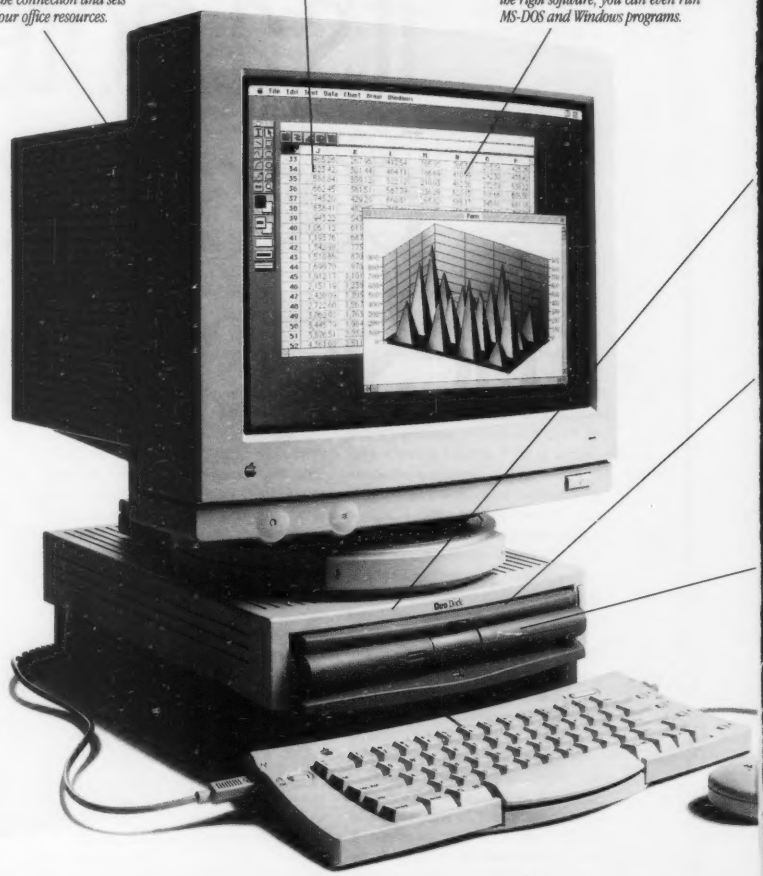

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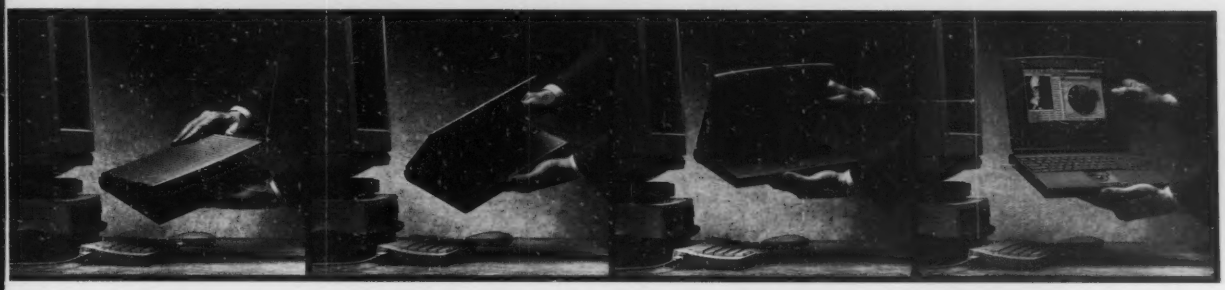

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Portable power. *The PowerBook Duo is a full-featured computer with a gray-scale supertwist display. It works up to 4.5 hours on a single battery charge.*

Expandable. *The Duo Dock has two NuBus™ expansion slots (for such additions as 24-bit graphics and Ethernet) and ports for up to six peripherals.*

Plenty of storage. *You have one set of files, wherever you go. PowerBook Duo stores up to 80MB (with the option of 120MB in the PowerBook Duo 230).*

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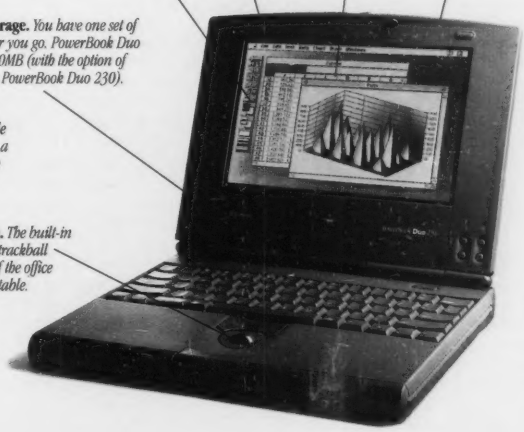

color display and any peripheral devices that may be attached.

In fact, you can use your PowerBook Duo with different Duo Docks in different offices, and no matter where you decide to work, the system will automatically set itself up for your connected resources.

When you're ready to leave, you just press the eject button, and the Duo Dock releases the notebook, much like a VCR ejects a videocassette. (Unless you have unsaved files on the screen — in which case it has the good sense to point that out before you disconnect.)

To witness a truly intelligent display of technology, see the PowerBook Duo System at an authorized Apple reseller today. Call 800-732-3131, ext. 100, for the name of one near you. (In Canada, call 800-665-2775, ext. 910.)

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Editorial

Fighting back

True story. Every fourth grade in every blue-collar town during the late 1950s had a bully, and in my class, I was he. It was great fun for me to pick on this big, docile kid who never fought back. One day I guess he'd had enough. A bloody nose and a fat lip later, I was a born-again pacifist having exited his last fistfight ever. The big kid? I suppose he learned that flexing some muscle once in a while ain't such a bad idea.

For years, despite having the collective power of a titan, the Society for Information Management (SIM) kept an extraordinarily low profile on most issues that interested its members — 2,700 IS directors who make up the greatest information technology buying force on earth.

SIM maintained an eerie silence in recent years as some software suppliers were screwing its members with unreasonable upgrade fees, rigid licensing options and inflexible contracts. In fact, at a meeting of SIM's biggest members a year ago, SIM leaders scrambled to control damage when, in an informal discussion, some members aired their anger.

A year later, at the same annual meeting, the big kid finally struck back. As reported last week, SIM has released a software license manifesto. No, it doesn't want software for free. But it is not going to let its members be taken to the cleaners by vendors that don't deliver significant value-added to software and services but charge as though they do.

Although the language of the SIM position statement is somewhat general and therefore vague in a few places, it is a major initial step in bringing order to the chaos that has existed for far too long now.

Equally important, the statement cuts a wide swath across the practices of all kinds of software providers, not just large systems vendors. The SIM members at multinational corporations are demanding order from the fluctuating global prices of PC software. They are asking, "Why should we pay $1,000 abroad for the same package that costs $300 in the U.S. and whose marginal cost of manufacturing is about $10?"

The impact of the SIM memo is already apparent. Vendors we spoke with last week endorse the baseline principles of fairness that the society outlined. SIM is even encouraging the vendors to state publicly in their advertising materials that they support the guidelines.

It would be a positive step to hear from the two big software vendor organizations, the Software Publishers Association (SPA) and the Information Technology Association of America (ITAA) regarding the SIM memo. The SPA and ITAA have not been shy about speaking on behalf of their members on issues such as software bootlegging and contract programming legislation. Let's hear from them on this most pressing issue from the voice of the buying community.

Meanwhile, SIM must keep up the pressure in its demand for greater fairness in this time-critical issue.

Bill Laberis

Bill Laberis, *Editor in chief*

Letters to the Editor

Proof of purchase

Joe King's article "Don't get swept up in 'upgrademania'" [CW, March 22] regarding the vertigo caused by the software marketing technique he terms "upgrademania," demands a postspin response. It is impossible to stay abreast of the constant updates to software. I want the additional features and functionality, but I also need more time between upgrades to implement them.

On the issue of competitive upgrade fraud supported by the retail channel, King is way out of line. I work for a major software retail chain, and we are reminded daily not to sell any upgrade (competitive or otherwise) without proof of ownership. Notification to the publisher is filled out before the customer walks out the door.

None of the software publishers that we deal with encourage us to "look the other way" when it comes to upgrade documentation reporting. We are regularly audited. King has a responsibility to work with retailers to ensure compliance with upgrade documentation reporting. Retailers are not the problem.

Keith Stillinger
Atlanta

Hold responsible

Because I am not a lawyer, I do not know the legal definitions of "libel" or "slander." However, having participated in corporate environments for almost 20 years, I have seen countless cases of so-called "harmless" talk used purposely to cast an individual in a particular light.

Irresponsible and false statements have caused people to lose promotions and their jobs. And it is also true that many responsible and true statements have helped to oust others. E-mail and public bulletin boards have the added feature of being reprintable.

It is unfortunate that ours is a world run by gossip. Because it is doubtful that that will change in our lifetimes, I strongly agree with Paul Gillin's conclusion in his editorial "Flame out" that users of electronic forums need to accept responsibility for their actions. However, there are a lot of people out there who might want to question Gillin's statement that "It's generally harmless."

Tom De Baker
Minneapolis

Booming business

I was surprised by Charles Babcock's comment that Oracle's U.S. applications business was "faltering" ["Tool time," CW, April 12]. I think "booming" is a more apt adjective. While we don't publish results for the U.S. separately from worldwide, overall applications license revenue is up nearly 55% this year to date ($42 million) and was up 130% in the last quarter.

The U.S. has been a major contributor to this remarkable growth. "Faltering" doesn't quite capture this reality.

George Koch
Senior vice president
Oracle Corp.
Redwood Shores, Calif.

Search and you shall retrieve

The article "Why business managers are empty-handed" [CW, April 5] was excellent but did not adequately examine the role that content-based retrieval systems can play in a corporate document management strategy.

Keyword searching is expensive in time and space, but a retrieval strategy that depends on keywords and character string matching is not really a content-based retrieval system.

True content-based retrieval applies techniques from fields as diverse as statistics and artificial intelligence to help managers find relevant information.

Some of these techniques are concept trees, soundex, pattern matching, word stemming and word proximity. These techniques far exceed the capabilities of simple keyword indices; they enable the user to strike a balance between recalling too much information and not recalling enough.

Content-based retrieval, which can be integrated with information foldering and linking, can help managers collect the information they need to make decisions.

Richard A. Menard
Framingham, Mass.

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If you can't be a know-it-all, be humble

Michael Cohn

People used to think we computer folks were pretty smart. We spoke in strange acronyms and sounded smart. We wore thick glasses and looked smart. We built databases, tended water-cooled mainframes and got paid as if we were smart.

But this is the '90s — practically the mid-'90s — and looking smart isn't that easy anymore. Buzzwords don't cut it. Assembler doesn't cut it. Dump-reading and flowcharts don't impress anyone anymore.

If you're in IS, it's probably time to let go of your listings, step out from behind your console and take a hard look at what you bring to the table. Hint: Some of the following had better be on the platter.

GREG CLARK

•Business skills. In the beginning, companies wanted programmers. We coded, they paid us, and everyone was happy. Then the companies wanted more. We had to understand applications. We had to talk to users. It was terrible.

Now it's even worse. Companies want industry skills. They expect us not only to know their business but the business of their customers, suppliers and competitors. They want us to walk into meetings and show how IS will provide competitive advantage.

This is a lot to ask from guys who need a week and a half just to write a page-break routine.

•Negotiation skills. You can't get by without them. And it's not just negotiating with your boss for a raise or negotiating with your CFO for more capital. In the new multiplatform, multivendor world of IS, true negotiating skills get tested every day as you beg, pray and plead with all these vendors for support — or at least for them to pick up the phone.

•Communications skills. In the old days, no one outside IS understood IS. So the quick way to the top was to be the guys who explained to executives how your expensive technology worked.

Now, to get to the top, you may have to become the guy who explains to executives why your expensive technology hasn't worked since 6 a.m. last Tuesday. It might also help if you are pretty good at begging for mercy: See "negotiation skills."

•PR skills. IS today requires a mastery of public relations, or at least personnel relations. That's because you're going to have to defend your existence, especially to head count-happy folks in personnel.

In the downsized '90s, convincing the bean counters that they really need a fully staffed IS department can get a little tricky, especially when you are trying to explain why it still takes three shifts of 10 operators to run an AS/400 and two PCs.

•Humility. Once there was a very pleasant time when the rest of the world knew nothing about computers, and they were glad to keep it that way. Those days are gone. Now, we have to contend with power users — folks with PCs at work, PCs at home and a half-dozen disks in their coat pocket.

These guys love to back you into a corner during a meeting, wanting to talk about information systems. And all your years of DASD and MIPS and structured methodology cannot save you from all the scuzzy-mousey-hertzy stuff they spew at a mile a minute.

So learn some modesty. Learn humility. And, most importantly, learn to say, "Yes, but have you thought about INTEGRATION?" — and then bolt for the door.

Cohn practices humility in Atlanta.

Danger! There's nobody to steer client/server

LISTEN UP! *by* Elaine Bond

The herd instinct often leads us from one extreme to another, and that's what seems to be happening with mainframe vs. client/server architectures today. The glass house is definitely "out," and client/server is "in."

That's fine, but before we discard the old ways completely, we need to figure out who is going to integrate all this wonderful stuff and make sure it delivers the kind of operational characteristics we've come to expect.

In the mainframe era, it was clear who had the responsibility for "end-to-end" services such as architecture planning, ensuring performance, reliability and serviceability, guaranteeing recovery and so forth. Those responsible may not have always executed well, but at least we knew who they were — IS personnel with major support from the system vendors.

In a client/server environment, the answer to "Who's responsible?" isn't so clear.

If traditional mainframe professionals are given the task, they will most likely replicate the glass-house environment.

Here's a real-life example: A major corporation that had been highly decentralized recently recentralized its LANs under the control of its former IS manager. This was done in the context of a move to a new building, with a high-tech, industrial-strength infrastructure. Telecommunications closets were placed on each floor to bridge backbone wiring to floor wiring, and each floor was also equipped with locked "server" closets.

This is distributed?

You have to ask yourself: If that's the only way to ensure control, is there any difference, aside from the price of components, between distributed architectures and mainframes? But if mainframe-trained personnel aren't the ones to manage client/server, who is?

When client/server entered the picture, we were thrown back to something very much like the old "Heath kit" days of component buyers and builders. Alongside the tightly integrated collection of components called a "mainframe," we now have sprawling collections of systems, integrated in what would be kind to call de facto fashion. And instead of trained electrical and design engineers attempting to understand and design for the interrelationships of the computing nodes (hardware, software and data), we have the "sneaker brigade."

When the components are physically spread out and subject to local control, we may also have end users and administrators with even less knowledge, training and skills impacting the operational and performance characteristics of the network.

Building client/server networks from the workstation up has been exhilarating, challenging and fun. It has produced many quick benefits. But once you start growing into enterprise-level networks, someone or some set of highly skilled people must take on the responsibility for end-to-end performance and operational characteristics.

The answer isn't in locked closets. It isn't in trying to replicate the glass-house environment or in building "virtual mainframes." It is in learning to design and implement unique client/server architectures as elegantly and efficiently as we did with mainframes. Right now, we don't have many people equipped for that challenge. We have to create more of them quickly.

Bond is a Chase fellow and senior technology consultant at The Chase Manhattan Bank N.A. She is a founder of the user advocacy group, Open User Recommended Solutions (OURS).

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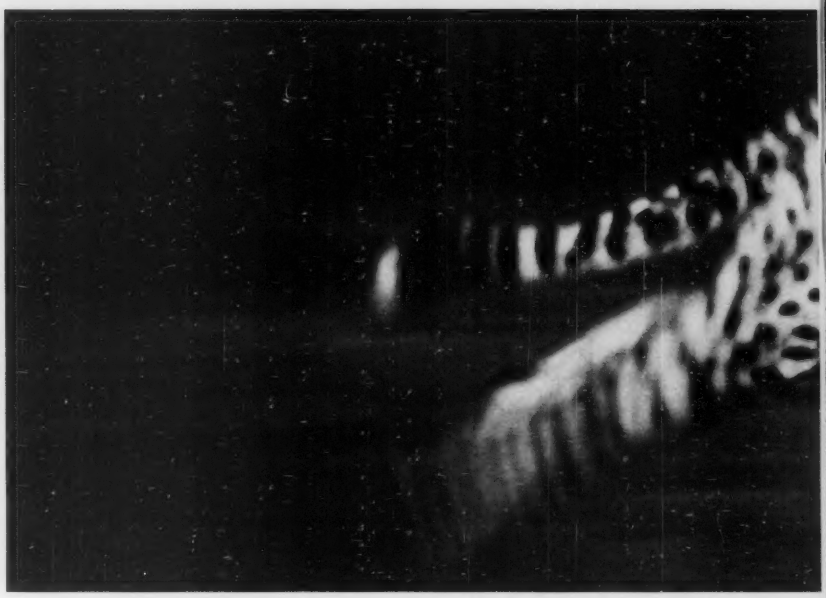

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Charles Babcock

Go with the flow

Work flow is usually thought of as one part of a desktop program. That's changing, however, and work-flow software is rapidly becoming a significant category in its own right.

Productivity experts say disorganized information is one of the greatest barriers to greater workgroup output. If work-flow software can automatically feed the right data into routine and dynamic tasks, it has the potential of becoming the next killer application on PCs.

In part, work flow represents a kind of collection of those programs that have enhanced individual productivity — word processing, database, communications and spreadsheet. A work-flow system pulls together data from diverse sources and puts it in forms or documents that push a task forward. It also defines the route along which these results should flow, monitors their progress and tracks versions of a document to see who did what to it and when.

But there's no single, clear-cut way to do all this, as was evident in recent talks with two work-flow system progenitors — XSoft and Reach Software Corp.

"The key is to enable people to collaborate," Barry Obrand, XSoft's vice president of marketing, said from his office next to Xerox PARC in Palo Alto, Calif. XSoft builds its InConcert system around a relational database system, currently either Oracle or Sybase, and runs it on a Sun or IBM RS/6000 server. Clients are SPARC or RS/6000 workstations and 386/486 PCs.

Reach Software, a 50-employee start-up in Sunnyvale, Calif., has a different approach. "The important thing is to leverage the existing local-area network," said Anand Jagannathan, Reach's president and co-founder of Banyan Systems.

Reach's Workman makes use of the Message Handling Service built into Novell's NetWare or the E-mail transport built into Banyan's Vines to move information and documents around. It doesn't sit atop the existing E-mail system. Rather, it is a co-resident application on the LAN server, with capabilities not available in E-mail. The client PCs are running Microsoft Windows 3.0 or 3.1.

Reach builds work flow on the existing Windows and LAN infrastructure. It does not rely on an RDBMS because it can use the integrating force of Windows and the underlying Dynamic Data Exchange and Dynamic Data Link Libraries of Windows applications, Jagannathan noted.

XSoft has stronger conceptual roots. It is based on a vision of how information and documents should be shared and, with its database underpinnings, offers more real-time capabilities. With the database on a server, it also offers greater security, a consideration if the data involved is crucial to the firm's operation.

Each approach has its backers. Reach has raised about $5.5 million from three San Francisco Bay area venture capital firms, with Novell as an additional backer. Kim Peyser, chief operating officer, is a former vice president at Novell.

The 360-employee XSoft was set up as an independent business by Xerox in 1991 after researching object system management and document management. Obrand was a vice president and general manager at Ashton-Tate.

Sitting literally in the shadow of the famous Xerox PARC, XSoft officials worry that a Xerox group will once again invent leading technology and have sales stolen out from under it by lower priced or better packaged implementations.

Workman, with its common denominator approach, threatens to do that. But at the same time, the PC-based approach leaves obstacles for end users to leap in order to gain access to mainframe data.

Neither approach satisfies all needs, but each brings a new level of coordination to group projects.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

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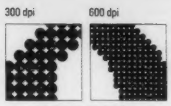

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Price cuts, PC sales to taper off in '93

By Michael Fitzgerald
SANTA CLARA, CALIF.

PC pricing will not fall in 1993 the way it did in 1992, according to a new report by Computer Intelligence/Infocorp.

The report predicts that users will react to this price moderation by buying fewer PCs in the second half of the year, forcing the PC industry to do its version of the shimmy as the market shakes out.

Part of that shakeout will be attributable to the gangbuster first half of 1992, said Kimball Brown, CI/Infocorp vice president.

"We don't see price cuts continuing at last year's pace, so 1993 will be just like 1992, but in reverse," Brown said. He said vendors that have been ramping up to handle this year's continued high demand, which is running more than 30% above demand during the first half of 1992, may catch up just in time to see year-to-year growth literally stop.

Such a scenario could deal a knockout blow to financially shaky vendors. "If you're a smaller vendor and you're not preparing for growth rates to slow way down, you're going to be in trouble," Brown said.

The PC industry will be dominated by the 486 chip from Intel Corp. and other vendors in 1993, with Intel's overall production expected to decline late in the year in the face of competition from IBM, Advanced Micro Devices, Inc. and Cyrix Corp./Texas Instruments, Inc., according to a CI/Infocorp report.

While users will buy more units in the second half of 1993 than they did in the first, CI/Infocorp said compared with 1992's huge growth spurt, U.S. PC shipments will fall slightly in the fourth quarter; worldwide market numbers will slip by 5%.

The result will be going-out-of-business sales and consolidations, as well as companies retrenching to focus on specific niches.

Some vendors, such as Northgate Computer Systems, Inc., have completed their restructuring and the trend may have recently started to accelerate. Hyundai Electronics America, after its big end-of-year effort failed in 1992, has put its PC business through a massive restructuring and executive purge. The company said it will now focus on multimedia PCs.

Despite the growth slowdown expected in its second half, 1993 will be the second consecutive year of double-digit growth in the PC market after single-digit growth in 1991. CI/Infocorp projects 15.9% growth in the world market, following 1992's unexpectedly high 17.6% gain. Brown also said it was possible that the second half of 1993 could see higher than expected growth if component pricing declines help spark a second-half price war, driving up demand again.

Among the top U.S. vendors, CI/Infocorp projected a strong year for IBM PC Co., with a 30% growth spurt that will regain its top position in the U.S., while Apple Computer, Inc.'s growth slows down to about 15%. Compaq Computer Corp. will gain on IBM, with at least 50% growth expected, but Dell Computer Corp. and Gateway 2000 Ltd. will continue to outgrow Compaq.

CI/Infocorp predicted, in fact, that Dell will become the fifth largest PC vendor in the world in 1993, nosing out mass market champion Packard Bell and slumping Commodore Business Systems, Inc. AST Research, Inc. will also have strong growth worldwide, although CI/Infocorp predicted flat U.S. sales for the PC maker.

Musical market shares

Revamped strategies, price cuts and new product announcements shuffled 1992 vendor ranks and produced a 17.6% increase in shipments over 1991

1992 worldwide shipment leaders *

		1991 rank
IBM	3.26M	1
Apple	2.75M	2
Commodore	1.60M	3
Compaq	1.59M	5
NEC	1.54M	4
Packard Bell	0.71M	8
Dell	0.71M	10
Toshiba	0.67M	7
Epson	0.62M	6
AST	0.61M	9

In the U.S. the Top 5 vendors stack up a little differently

1992 Top 5 U.S. shipment leaders*

Apple	1.50M
IBM	1.26M
Compaq	0.72M
Packard Bell	0.67M
Dell	0.45M

*Ranked by number of shipments

Source: Computer Intelligence/Infocorp

Norton Utilities 7.0 keeps pace

By Christopher Lindquist

In the PC utilities market these days, it pays to be light on your feet if you are going to keep ahead of Microsoft Corp. and its propensity for putting more and more utilities into operating systems.

One of the companies most adept at filling the market opportunities left in Microsoft's wake is Symantec Corp. Its Norton Utilities 7.0 continues that trend.

PRODUCT test DRIVE

The advances in this latest version of the venerable DOS utilities package are few in number, but they will be important to some users, particularly those who use data compression or who have large hard disks. Users who have lost one of the multiple manuals that came with Version 6.0 will also appreciate this lastest version.

The first group — those who use data compression — is likely to grow rapidly now that MS-DOS 6.0 is shipping with data compression built in. Norton Utilities 7.0 supports data compression in both its Disk Doctor diagnostic tools and the Speed Disk defragmentation util-

Norton Utilities, *page 41*

Center to spread data on health

By Rosemary Cafasso
ATLANTA

The national Centers for Disease Control and Prevention (CDC) plan to open up their massive database on health and disease statistics to public health professionals across the country.

Not that the data is currently off-limits. But getting to it has been a time-consuming and difficult task.

"There's about 6G bytes of data on-line and a lot more off-line," said Kenneth Long, a systems analyst and database administrator at CDC. "We have public health, scientific data, statistical data and a huge textual reference database. Currently, its primarily available to mainframe users, particularly at CDC."

But since 1990, CDC has been working to change that. The organization is designing a Microsoft Corp. DOS-based graphical data retrieval program that allows users to request data through a series of menus and prompts.

The front end interfaces with a CDC-designed communications server, dubbed the Wideranging Online Data for Epidemiological Research (Wonder) Communications Hub, that routes requests to a second server. It runs a set of IBM OS/2-based tools from Software AG of North America, Inc. that perform queries directly to the mainframe and navigate through the different communications protocols to get at the Software AG Adabas database management system on the host.

Long would not reveal the project costs, which include the front-end software. He said CDC will give it to users at no charge, providing they are public health professionals. "We are under some budget restraints, but CDC Wonder is important enough and will continue to be funded," Long said.

In February, a version of this system was released with basic functions, including electronic mail and limited database access. About 500 users inside and outside of CDC tested it, and while it was considered a production version, Long said it had "very limited functionality and only a very small amount of mainframe data was available."

Easier access

But Version 2, currently scheduled for completion in June, will deliver the full-blown PC-based front end. Currently, Long's team is fine-tuning the performance among the Wonder Communications Hub, the data access server and the mainframe. The goal is to provide easier access to a wider range of data, he added.

Long considers this front-end software to be critical to the success of the new system. It was written in the C programming language and designed for the DOS operating system because "governmental health agencies often can't afford Windows [systems], so it is character-

Center, *page 41*

ON SITE

The Centers for Disease Control
Atlanta

Goal: To make it easier for public health officials to access the CDC's huge collection of health and disease statistics.

Approach: Develop a front-end system that includes user-friendly Microsoft Corp. DOS-based PCs and a set of server-based tools to interface with the host, a Software AG database management system.

Expected results: Help health officials make better use of data by presenting it in a graphical format.

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PC security

Beware of spring

By James Daly

May's warm weather may feel good, but don't let it lull you into complacency when it comes to safeguarding your data.

It is a slow month for pernicious viruses in general, with only one really nasty creature set to strike. But there will still be plenty of non-destructive nuisance viruses around, according to the folks at Fifth Generation Systems, Inc., a Baton Rouge, La., developer of data security software.

The one bit of rogue code you should be especially on the alert for is the 1210 virus, which is sometimes known as the Prudents virus. It is set to activate anytime during the first four days of May.

The 1210 is a memory-resident virus that infects .EXE files when they are executed. It causes disk writes to be changed to disk verifies, so writes to the disk never occur between these dates — that is, no information can be saved to the hard disk.

It was first isolated in Barcelona, Spain, in December 1989.

As with all viruses, the activation dates are for general awareness and are not exclusive. With a little tinkering, most can hit at any time.

Lab tools becoming finance tools

By Michael Vizard
WILMINGTON, MASS.

Some of the tools commonly associated with scientific analysis are beginning to find their way into financial applications.

Labtech Corp. recently released Realtime Vision, a Microsoft Corp. Windows-based package that allows users to monitor business processes in real time using a series of graphic displays.

Based on data acquisition technology that Labtech offers for laboratory and industrial applications, Realtime Vision makes use of a Dynamic Data Exchange link to monitor data stored in spreadsheets and databases.

Realtime Vision then takes this data and displays it in trend charts, digital readouts, analog meters and dials, which were designed to fluctuate as the data changes.

Labtech President Fred Putnam said he expects securities analysts, retail sales offices and service providers to be among the users that will be interested in real-time monitoring of data.

For example, Fox River Financial Resources, Inc. in Batavia, Ill., has adopted Realtime Vision to monitor its trading activities.

Fox River has a number of custom artificial intelligence programs that execute trades based on a predetermined model.

Testing against predictions

Fox River President Keith Dickson said he uses Realtime Vision to monitor how closely his programs are executing trades compared with the actual forecasted test model.

"It doesn't lie. It tells me the story graphically, so it's quantitative," said Dickson, who noted that any slip in Fox River trading programs can cause the company significant losses.

Realtime Vision is priced at $99 until the end of this month. After that, it will be priced at $395.

A developer's edition of the product is priced at $995.

Software application packages

Expert Choice has released Version 8.0 of the Expert Choice decision-support program.

The DOS-based product assists users by organizing complex problem-related information into a hierarchical model comprising a goal, criteria, possible scenarios and alternatives, the firm said.

Features include graphical adjustment of criteria importance, an enhanced information screen editor and mouse support.

The product runs under DOS 3.2 or higher and requires a PC with at least 640K bytes of random-access memory.

Single-user versions cost $495. Prices for network and runtime versions depend on configuration.

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Wolfram Research, Inc. has introduced Version 2.2 of Mathematica, a software system for technical computing.

New features have been included in areas such as programming, notebook interfaces and numerical, symbolic and graphical computation. Additional linear algebra and differential equation capabilities are also provided.

Mathematica 2.2 prices start at $595.

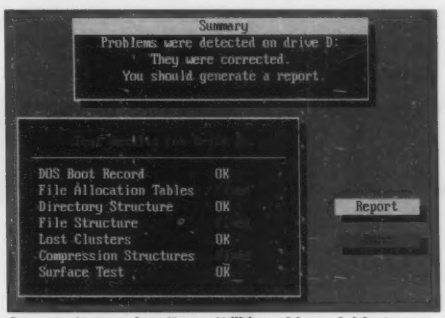
▶ *Wolfram Research*
100 Trade Center Drive
Champaign, Ill. 61820
(217) 398-0700

Norton Utilities

CONTINUED FROM PAGE 39

ity. But Microsoft's DoubleSpace compression is not the only data compression method out there, so Symantec has built Norton Utilities 7.0 to support Stac Electronics, Inc.'s Stacker and AddStor, Inc.'s SuperStor compression algorithms as well.

The updated Norton Utilities also supports large hard drives — up to 2G bytes. However, be aware that supporting such large drives can require 1M or 2M bytes of extended or expanded memory. While it is unlikely that many machines with 2G-byte drives have less than a couple of megabytes of memory, it must be free memory that is not being used by device drivers or resident applications.



Symantec's upgrade to Norton Utilities *adds useful features for users employing data compression*

The enhanced Norton Utilities also includes a set of hardware diagnostic programs that run the gamut of memory, disk, video, CPU and other tests intended to help technicians pinpoint system problems. Symantec even provides loop-back connectors for testing serial and parallel ports. They are useful for technicians, but the brightly colored connectors will probably see more time stacked on user's desks than they will on the back of PCs.

Finally, my favorite new feature is the manual that now comes with Norton Utilities. It is a *single* volume that covers all the features — no more losing the slim multiple volumes that came with Version 6.0 (and they were so thin you could practically lose them on the shelf), and no more hunting for the proper volume. In addition, the manual has one of the more usable "lie-flat" bindings I have seen, although time will tell if it is sturdy enough for heavy use. No more forcing the books to stay open by balancing the stapler on them.

I have one small concern. The NDOS command processor documentation is now included in a rather large (1M byte) text file instead of in the printed manual. That is a plus if you like to search for things on-line but a minus if you prefer to have paper in your hands.

Other features of note include the following:

- DupDisk, a single-pass disk copier that makes an exact duplicate of one floppy to another (of the same size and capacity) without wasting time playing floppy swap.
- Disk Editor has been enhanced to allow you to attempt to rescue data from badly damaged disks by "virtualizing" the physical disk. It is another useful feature for brave technicians, but not something you will want the average user to mess with.
- File Fix now supports larger files by using extended and expanded memory.

So who needs the latest Norton Utilities? The new manual may be worth the upgrade price of $49 for registered users. Anyone who is using or planning to use data compression, but who wants to stick with the trustworthy Norton Utilities, will want to pick this up, as will anyone using large, network-size disk drives. But older versions should still be fine for average users with uncompressed or smaller drives.

Norton Utilities 7.0 has a list price of $179. Symantec also reports that many large software retailers are offering Norton Utilities 7.0 for $99 to purchasers of MS-DOS 6.0.

Center spreads data

CONTINUED FROM PAGE 39

based with a graphical user interface."

The front end will give users "an analysis system" that they have not had before, Long said. "It will allow them to generate tables and graphs from the data that's sent back to them," he said.

The software is menu-driven and guides users through a series of prompts and menu selections to narrow their requests for data. Then they "fill in the blanks" for their request and send it to the CDC network, Long said.

Some of the requests are quick hits on the database for statistical information and take no longer than a few minutes. But others are long searches and require downloads of text abstracts that can take 15 to 30 minutes, Long said. As a result, CDC included a feature in the Wonder Communications Hub to keep track of queries. The user can submit a request, log off the CDC system and then return later to retrieve the information.

In addition to ease of use, the new system will address another big issue: security. Long said the front end was designed to provide access to public information and restrict users from entering other areas of the CDC host system. "They will not have direct mainframe access," he said.

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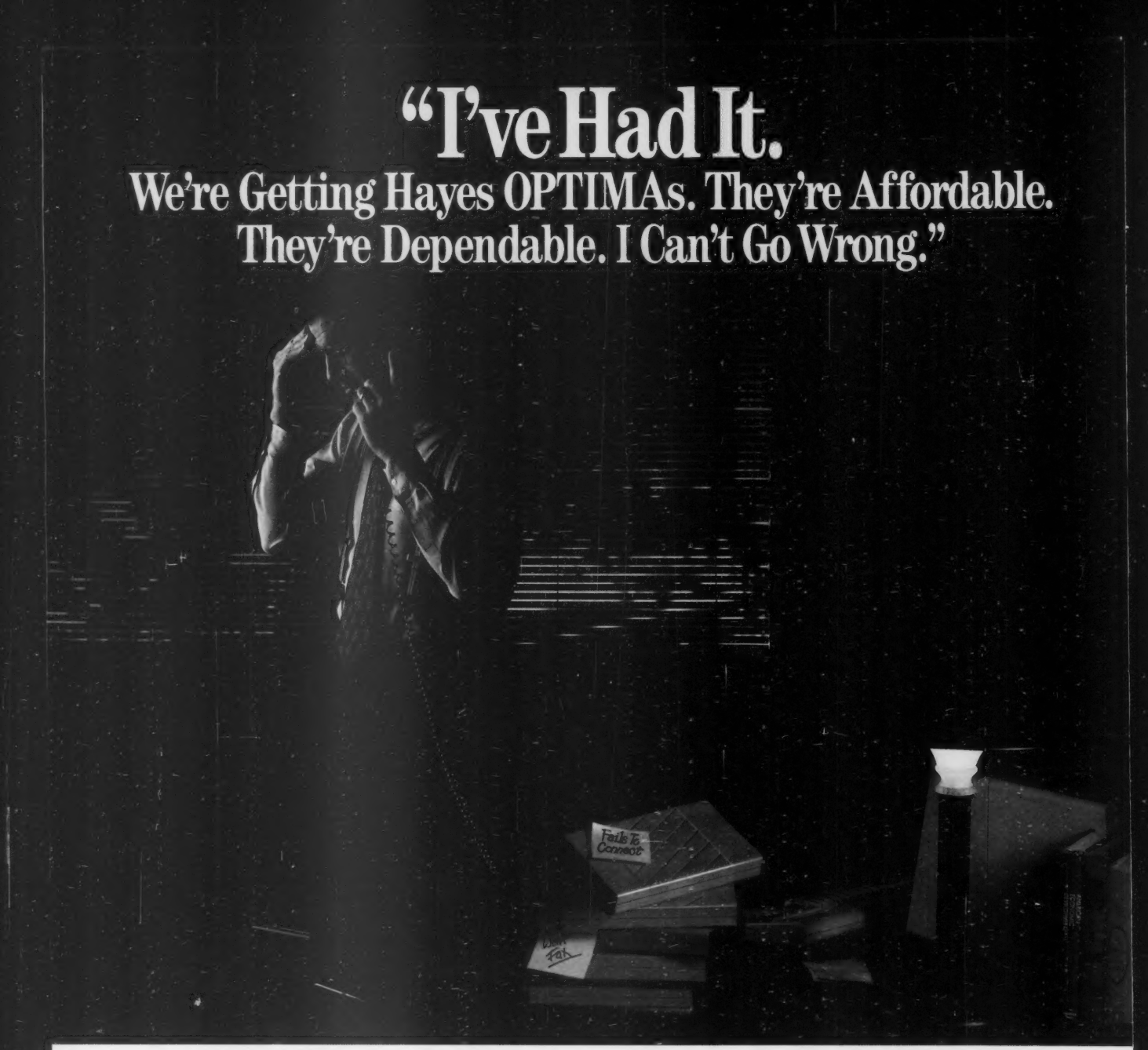

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IBM aims for Novell arena with servers

By Michele Dostert and Kim S. Nash

■ Taking advantage of its newfound independence, IBM PC Co. has targeted its recently announced midrange server squarely at users of Novell, Inc.'s NetWare local-area network operating system.

The uniprocessor versions of both the new Personal System/2 Server 195 and IBM's high-end PS/2 Server 295 are now Novell-certified for use with NetWare v3.11; NetWare support for the multiprocessor versions of the servers will be available in the third quarter.

The servers also support OS/2, IBM's LAN Server 2.0 Advanced and Microsoft Corp.'s LAN Manager.

IBM is touting three-year, on-site, fast response service for the PS/2 Server 195.

"IBM running NetWare from the start is a first," said Brad Day, principal analyst at Dataquest, Inc.'s office in Framingham, Mass. Day added that the move signals the strong influence of IBM's recently formed Client/Server Computing unit. "They know that to be taken seriously in client/server, they have to run a lot more than OS/2."

The PS/2 195, with a base price starting at less than $20,000, is built to order for each customer by IBM. Based on a single Intel Corp. I486/50 processor, the server can be upgraded to a multiprocessing system.

The 195 is especially designed to handle LAN I/O needs, with two 32-bit reduced instruction set computing microprocessor-controlled disk channels, Small Computer Systems Interface technology and support of up to 29G bytes of hard disk storage using Orthogonal redundant arrays of inexpensive disks level 5 (RAID-5) technology.

Corporate target

Hoping to lure corporate LAN buyers, IBM is touting the PS/2 Server 195's fault tolerance and configurability, as well as three-year, on-site, fast-response IBM service.

"Our first requirement was Novell certification, and the 195 has that," said Alex Hoffman, vice president of information systems at Millers Group, a Fort Worth, Texas, insurance company that is consolidating three servers onto a single 195. "Secondly, because we are running mission-critical applications, we needed RAID-5 support, which ensures that we can quickly rebuild our disks in case of failure."

Hoffman also said he expects IBM's fast-response support to be a vast improvement over the local-dealer support he gets with the three clone servers he has now.

Middleware question on NT

Work-flow software vendors wonder about Microsoft's ultimate plan

By Michael Vizard

As the official launch of Microsoft Corp.'s Windows NT draws near, independent software vendors that specialize in technologies such as work-flow and scheduling software are nervous.

Currently, these products are used to provide the infrastructure for building distributed groupware applications in PC environments, but questions concerning how much middleware technology Microsoft will bundle with NT is pushing software vendors to develop product lines that span multiple operating systems.

For example, Microsoft plans to bundle electronic-mail services with the Advanced Server version of Windows NT. Because many work-flow products are based on E-mail transports, industry analysts said Microsoft's need to differentiate its operating systems from rival offerings will push the company into bundling more middleware technologies, such as work flow and scheduling, into the operating system.

"Mail should be bundled in the operating system since it's really a basic transport, not an application. Once that happens, it's only a matter of time before they add procedures and rules-based tools for work flow and scheduling. It's self-evident," said Neil Hill, a senior analyst at Forrester Research, Inc. in Cambridge, Mass.

"Any [independent software vendor] who is not worried about Microsoft is smoking dope," noted Conall Ryan, president of On Technology, Inc., a Cambridge, Mass., developer of electronic meeting software that recently deployed its software on both Windows and Apple Computer, Inc. Macintosh platforms.

Still a benefit

Even if Microsoft does not bundle work-flow and scheduling software within NT, software vendors can probably expect Microsoft to at least market these types of products as E-mail-enabled applications, noted Anand Jagannathan, president of Reach Software Corp., a provider of work-flow software in Sunnyvale, Calif.

To combat Microsoft's expected entry into these markets, vendors are highlighting the fact that products such as work-flow offerings and scheduling software packages must work across Windows, Macintosh, OS/2 and Unix environments to be truly effective.

"I wouldn't be surprised to see Microsoft put scheduling and routing into the operating system, but existing work-flow vendors will offer more in terms of functionality and support for other operating systems," said Karen Styres, director of marketing at Edify Corp., a provider of work-flow software in Santa Clara, Calif.

"If Microsoft puts these features in the operating system, it may actually serve to validate the market and kick it off," she added.

However, given the work on NT Microsoft still has to complete, software vendors expect it will be some time before Microsoft adds work-flow and scheduling features to NT.

Middleware, *page 48*

As the market for work-flow software evolves, two distinct disciplines appear to be emerging. One class of work-flow products relies on E-mail such as Reach Software's Workman. The other class relies on database technology such as ViewStar's namesake product.

Network operating systems

Sharing software ekes more life out of older Unix boxes

By Maryfran Johnson
TORONTO

Utopia seems like a mighty unlikely concept in places where hundreds of Unix workstations are tying the network into knots.

But in the case of Platform Computer Corp., Utopia is not a pipe dream but a product.

This small spin-off firm from the University of Toronto is now negotiating with several major workstation vendors for distribution rights to its sophisticated yet virtually unknown network operating system, called Utopia Load-Sharing Facility (LSF).

"Utopia is a network operating system that makes it easier to share compute resources across a heterogeneous Unix network," said Songnian Zhou, president of Platform Computing and an assistant professor at the university's Computer Systems Research Institute.

"Other vendors are providing bits and pieces of this capability," Zhou said. "But nobody has had a vision of unifying all the Unix boxes and handling large-scale, heterogeneous programs under a uniform network operating system."

Among Utopia's handful of early user sites are Pratt & Whitney Aircraft Co. in Hartford, Conn., Mitre Corp. in Bedford, Mass., Bell Northern Research in Ottawa and the Superconducting-Supercollider Center in Dallas.

"We're using it fairly extensively with about 230 workstations in eight clusters," said Dan Minior, an information systems manager of commercial engineering at Pratt & Whitney. "This is really breakthrough technology. It's a shift in the way you use equipment because you can use a lower cost mix of workstations but get more out of them.

"Utopia gives you total control of the resources, so you can optimize them for batch, parallel or interactive processing," Minior explained. "A lot of people don't believe this until they see it themselves."

That disbelief factor actually led Zhou to pick the name Utopia, he said.

The technology is based on a suite of algorithms and mechanisms — developed over several years by Zhou and his researchers — that tie together disparate Unix boxes to form a virtual supercomputer. The software resides between the Unix operating system kernel and the applications, and it is currently available on Unix variants from Sun Microsystems, Inc., IBM, Digital Equipment Corp., Hewlett-Packard Co. and Silicon Graphics, Inc.

Utopia's main function is to transparently manage the computing work load by redistributing it across the network — a concept known as load-sharing. Installation of Utopia can be

Sharing software, *page 48*

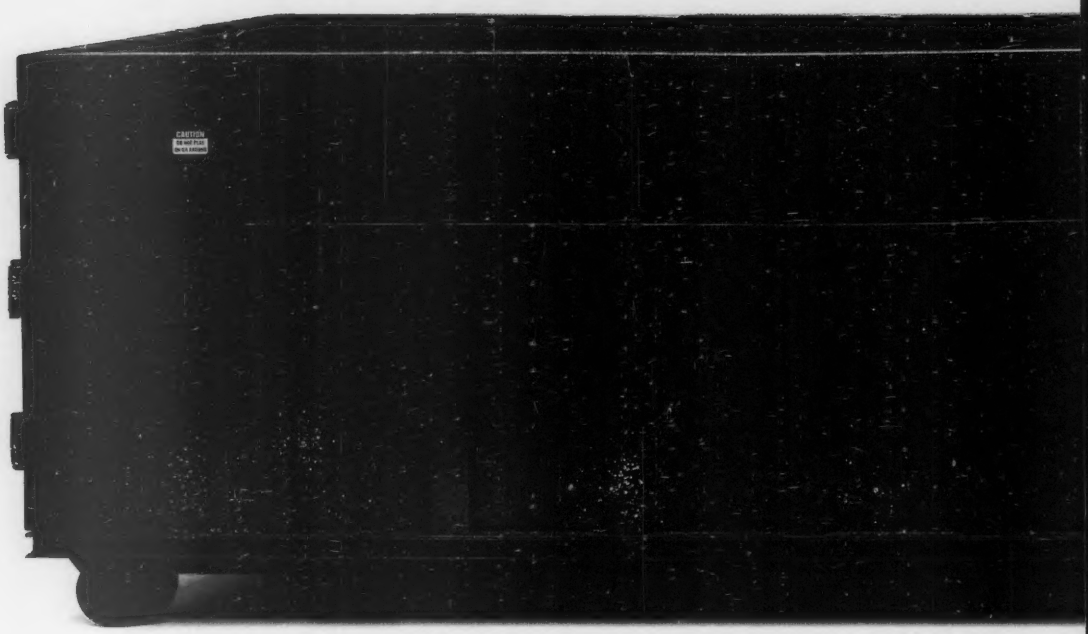
At a glance

Utopia LSF enables interactive, parallel and batch-computing jobs to be run on underused CPUs elsewhere in the network.

Available from Platform Computer on Solaris, AIX, Ultrix, SGI Irix and HP/UX.

Maintains information on host configuration and computer resources load.

Cost: $800 per workstation node, with some volume discounts available.



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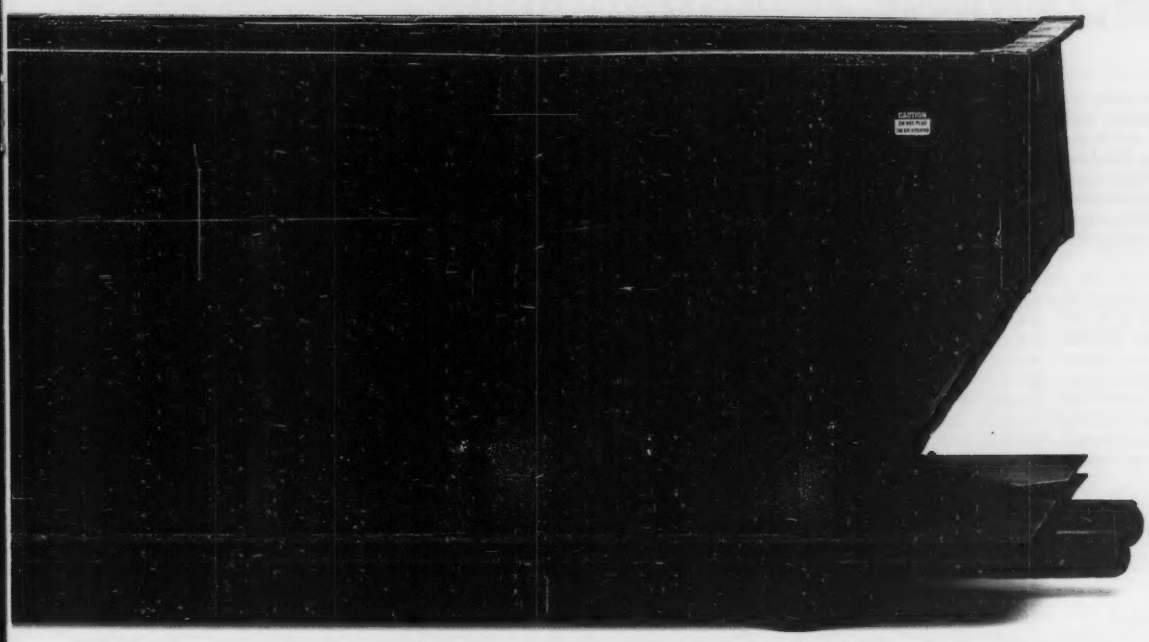

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Utility powers up text retrieval

Fulcrum engine part of Florida Power's customer service project

By Michael Vizard

■ As part of its plan to move to a client/server environment built on top of an IBM DB2 server and around Microsoft Corp. Windows NT clients, Florida Power Corp. has purchased a comprehensive site license for text-retrieval software from Fulcrum Technologies, Inc.

Florida Power, a subsidiary of Florida Progress Corp. in St. Petersburg, will use the Fulcrum text-retrieval engine and Search Tools as part of an effort to manage the data that the government requires nuclear energy utilities to keep on-line, said Nancy Smith, manager of system development.

According to Smith, Florida Power, which provides electricity to 1.2 million customers, evaluated Fulcrum and the Verity text-retrieval engine from Verity, Inc. Smith said the utility decided to go with Fulcrum because it was less expensive and has a more modular architecture that could be more easily linked to other applications.

The move to Fulcrum is part of a three-year customer service project that will go on-line in the third quarter of 1994. Valued at $48 million, the project is a joint effort with Andersen Consulting, with the application being written in Andersen's Foundation suite of computer-aided software engineering tools.

After deciding to move to a client/server architecture using DB2 as a server running on an IBM mainframe, the company chose to standardize on Windows NT, which takes 100M bytes of disk space to load and as much as 32M bytes of memory to run, as its client platform for the project.

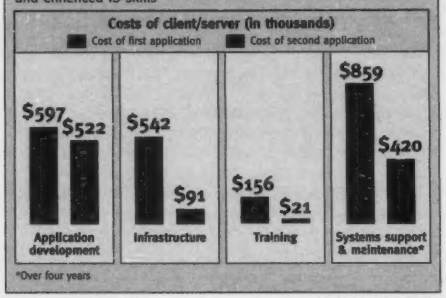
"We really need a preemptive multitasking operating system for this application," Smith said.

Currently, developers at Florida Power are using OS/2 to create the customer service application, but Smith said the application will be deployed on Windows NT desktops because the utility anticipates that Windows environments will ultimately have the most software.

The value of the Fulcrum license was undisclosed.

Buy one, get one at half price

While implementing a client/server system can cost more than $2 million, the cost of adding a second application may be only half that amount because of new system management products and enhanced IS skills



Source: Forrester Research, Inc. CW Chart: Michael Siggins

Middleware questions

CONTINUED FROM PAGE 45

"It will be at least two years before Microsoft gets around to bundling work flow in the operating system. They are just now getting to the mail services and have not started on the directory services for mail," Jagannathan noted.

In addition, there is a school of thought that says mail services do not make the most effective media for work-flow and scheduling software. So while Microsoft may bundle work-flow software with its operating systems or E-mail software, there will still be a market for high-end work-flow packages.

Different models

"We believe that work flow is a middleware service that will be put in the operating system, but you have to remember there are different types of work-flow models," said Dave Ruiz, director of product marketing at ViewStar Corp., a developer of work-flow software in Emeryville, Calif.

For example, ad hoc work-flow applications may require only an E-mail system, but transaction-based work-flow applications will require a database system. And Microsoft is not likely to bundle both a database and work-flow software with Windows NT.

"E-mail is a pretty miserable platform for building scheduling software. You need a database to support multiple interactions and mobile users," Ryan said.

Like most software vendors, however, the near term for work-flow and scheduling software providers will be spent closely watching Microsoft.

"It's still probably two to three years away before Microsoft bundles work-flow type capabilities in the operating system, so until then work flow and scheduling will be high-growth areas," Hill said.

"E-mail comes with Unix, but there is still quite a large E-mail and office automation market for Unix," Styres added.

[redacted]

Applications

Executive Software, Inc. has introduced Version 1.0 of Diskeeper, a defragmenter designed for Digital Equipment Corp.'s AXP OpenVMS systems.

According to the company, the product is an on-line disk defragmenter that improves system speed and performance by consolidating fragmented files and free spaces on the disk.

While jobs are running, Diskeeper can be used without interfering with system activity. To prevent disks from becoming fragmented again, the optimum run frequency is automatically determined.

Diskeeper runs on both data disks and system disks, the company said.

Prices range from $2,000 to $7,105.

▶ *Executive Software*
6th Floor
701 N. Brand Blvd.
Glendale, Calif. 91203
(818) 547-2050

Xcelerated Systems, Inc. has released Liken 1.3, software that enables Unix workstation users to run off-the-shelf Apple Computer, Inc. Macintosh applications without any modification, according to the company.

Databases and files can be shared by using software residing in the Macintosh server, and Network File System-mounted storage, including tape drives, disk drives and disk arrays, can be used. Access to Meeting Maker, On Technology, Inc.'s group scheduling package for the Macintosh, is also provided.

A single-user license is priced at $695.

▶ *Xcelerated Systems*
Suite 130
9245 Sky Park Court
San Diego, Calif. 92123
(619) 576-3080

Unix

Data General Corp.'s Clariion Business Unit has announced the Series 4000 Tape Array, a high-performance, fail-safe tape array for Unix.

According to the company, up to seven 4mm digital audio tape cartridges can be supported that offer as much as 30G bytes of compressed storage. Data is backed up at a sustained rate of 3.5G bytes per hour.

To enhance performance the product has a 20M byte/sec. Small Computer Systems Interface-2 interface between the array and the host system.

Prices start at $19,500 for a five-drive system.

▶ *Data General*
4400 Computer Drive
Westboro, Mass. 01580
(508) 366-8911

Sharing software

CONTINUED FROM PAGE 45

accomplished within several hours, Zhou claimed, and the manual is only "tens of pages" long instead of hundreds.

The product is also architected to play cooperatively with the Open Software Foundation's Distributed Computing Environment and Distributed Management Environment, should those "middleware" technologies become widely used.

DEC is the first vendor to offer Utopia LSF to its customers as one of the batch-queuing and load-leveling software packages on the Alpha AXP workstation "farms," or clusters. Other vendors in various stages of discussion with Zhou include HP, Convex Computer Corp., IBM, Sun and Silicon Graphics.

However, striking a deal with Platform Computer may present something of a two-edged sword to the vendors, which stand to lose some hardware sales when Utopia cranks up performance on their older boxes.

At Pratt & Whitney, for example, Utopia helped triple the performance of a Sun workstation cluster containing about 25% older, lower performance IPC workstations and 75% IPX systems, SPARCstation 2s and SPARCstation 10s.

"We're able to run these IPCs three times faster under the interactive load-sharing shell of Utopia LSF," Minior said.

In one recent example, he noted, a mathematical calculation that previously took one hour to run on a SPARCstation 2 was trimmed down to only five minutes by spreading the processing load over the cluster.

Dynamic duo

Utopia's foundation is built on two servers: the Load Information Manager and the Remote Execution Server.

The load manager collects information such as CPU memory use, I/O traffic and host status and then acts as a resource to applications by telling them where to run jobs based on their specific requirements. A sample command might read: "Find 20 non-Ultrix hosts, each with at least 32M bytes of memory and idle for 10 minutes or more."

The remote server supports transparent, low-overhead remote job execution.

Utopia is somewhat similar to Novell, Inc.'s NetWare network operating system but is aimed specifically at the technical, engineering and scientific community rather than PC users. Where NetWare provides file and data sharing for a variety of open and proprietary systems, Utopia enables sharing of compute resources under Unix only.

Utopia also cannot offer much help with commercial database processing, high-intensity interactive graphics or PC networks, Zhou said.

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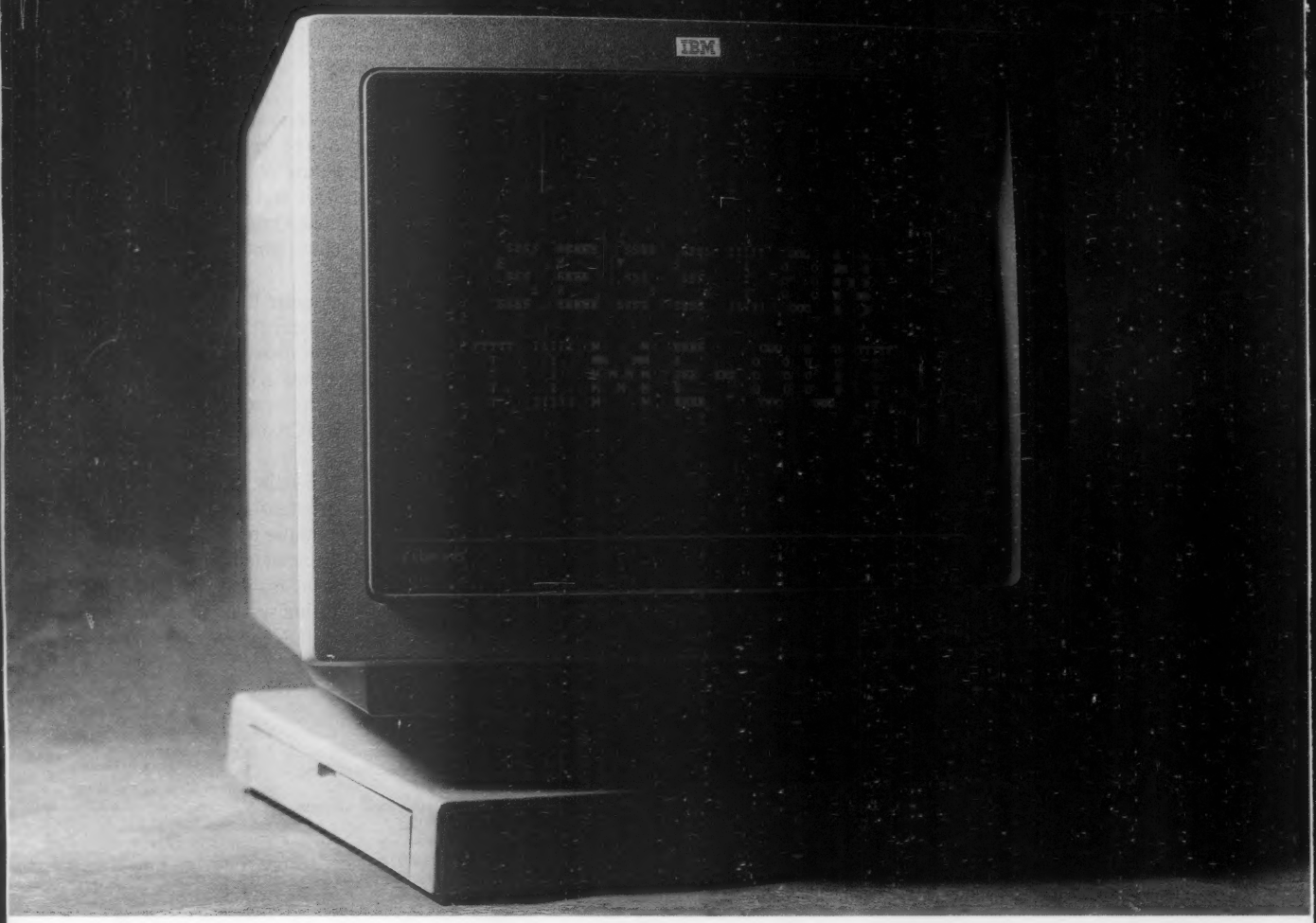

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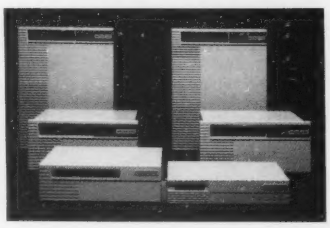

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Bank rich in APPN experience

Uses protocol to link AS/400, PS/2s, mainframes

By Elisabeth Horwitt
OTTAWA

An eye-opening presentation at IBM's recent Advanced Peer-to-Peer Networking (APPN) Implementors Workshop was given by Ken Smith, systems software manager at Canada Mortgage and Housing Corp., who related his three years of experiences with IBM's strategic internetworking protocol.

Canada Mortgage began using APPN to interconnect its IBM Application System/400s when they were first installed three years ago, Smith said. More recently, it implemented IBM's OS/2 Extended Edition Communications Manager to bring IBM Personal System/2s into the network.

PS/2s and AS/400s can act as APPN network nodes, which coordinate addressing and routing across the network, and as APPN end nodes, which can automatically register their own resources on a network node.

More recently, the Ottawa mortgage company became a beta-test site for the yet-to-be-shipped IBM VTAM Version 4.1, which enables an IBM mainframe to act as an APPN network node.

Canada Mortgage used the product to configure its IBM mainframe as a central APPN router that interconnects any two AS/400s in the company, Smith said.

The firm continues to connect its AS/400s through a mesh APPN network; however, a transmission might have to take two or three hops across intervening AS/400 nodes before it finally reaches its destination, Smith said. The new host-based connections are speedier because they make use of existing high-speed lines between each AS/400 and the host and because transmissions never have to go more than two hops, he added.

User potential

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AS/400s	200,000
3174s	300,000
S/36s and S/38s	300,000
PCs	10.9 million
Terminals	20 million

Source: IBM

CW Chart: Michael Siggins

Compared with traditional IBM Systems Network Architecture (SNA), APPN is far more flexible and easy to define, Smith said. For example, "If I visit Vancouver, I can log onto a terminal there and ask [the local APPN network node] 'pass me through to my office AS/400,' and it finds the best route."

Smith reported one minor drawback in the earlier APPN installation. When the network reroutes transmissions around a network failure, it does not know that it should restore the original route when the failure is over.

When this happens, network administrators may not know that a particular AS/400 is now actively routing APPN traffic. They might take it down for maintenance, cutting the connection. The new VTAM 4.1 APPN software fixes this problem, but it still afflicts the AS/400 version, according to Smith.

Help on the way

IBM is working on several APPN enhancements and features that would be of use to the Canadian company [CW, April 19].

One is the dependent LU requestor feature that enables traditional 3270 terminals and printers to communicate over a multihop APPN network. Canada Mortgage's AS/400s currently access the IBM host as 3270 terminals over direct connections. However, without dependent LU requestor support, they cannot take an APPN path through another AS/400 as an alternate route when the direct connection breaks down.

Smith said he would also like to see IBM improve APPN network management functionality in areas such as problem identification and correction, performance monitoring, network cost allocation and design.

"APPN has less network management than traditional SNA right now," Smith said.

Use outpacing addresses on the Internet

By Gary H. Anthes

■ At the present rate of growth, the number of computers attached to the Internet will exceed the world's human population in 10 years.

"That is a worst-case scenario used for Internet planning," said Tony Rutkowski, director of technology assessment at Sprint Corp. and a vice president of the Internet Society. "But in fact it could be worse, with more addressable objects with [Internet Protocol] addresses than people."

Commercial use of the Internet — the loosely connected and informally managed agglomeration of networks running mostly Transmission Control Protocol/Internet Protocol (TCP/IP) — is growing especially rapidly.

"It's become mainstream," said Lawrence Landweber, professor at the University of Wisconsin at Madison and an Internet Society vice president. "Just a few years ago, it was this plaything of the academics. Most [users] were in the U.S., most were at universities, and you couldn't tap into all the databases that are available now. We've now reached a critical mass of services and people."

Growing at 20% per month

There are now more than 10,000 IP networks connected to the Internet. In February alone, 1,000 networks hooked up, more than the total population just three years ago. Some 5 million people are believed to use the Internet, and total use is growing at a phenomenal 20% per month. "There is nothing like this in human or telecommunications or electronics history," Rutkowski said.

But, he said, the growth curve may just get steeper. Rutkowski pointed out that the new Microsoft Corp. Windows NT was written with TCP/IP networking in mind; it will even prompt users for an IP address when it boots up. "What Windows NT is doing is using TCP/IP to enable all kinds of seamless networking applications, just as Unix did for workstations," he said.

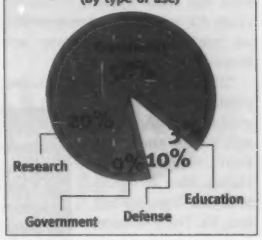
The number of hosts is a crucial issue because IP is now limited to the number of Internet addresses enabled by a 32-bit addressing scheme, a limit likely to be hit within two years or so. Several ideas have been proposed — and are in trial use today — to head off the exhaustion of network addresses.

For example, the Simple Internet Protocol scheme on the table could simply extend the IP address to 64 bits by deleting nonessential fields from the IP header. Another idea is to move part way to Open Systems Interconnect (OSI) by replacing IP with OSI's Connectionless Network Protocol, which is similar to IP. A third option uses a smart new IP header format and routing scheme.

Going commercial

The number of Internet Protocol networks in the U.S. reached 23,570 last month, with more than half of those in the commercial sector.

IP networks in the U.S. (by type of use)



Source: The Internet Society

Some of the alternatives being tested exact a stiff penalty. As they increase the number of addresses, the number of possible routes that must be maintained in routing tables quickly fills the available memory of today's Internet routers.

The options are being field-tested by the Internet Engineering Task Force. "The winner will be the proposal that proves out in practice, gathering support by an increasingly convincing demonstration that it can solve the problems," said Lyman Chapin, chief network architect at BBN Communications and chairman of the In-

Internet, *page 52*

Fiber bandwidth

Cable TV operator to extend fiber miles

By Joanie M. Wexler

America's fledgling information "superhighway" sprouted significant bandwidth-widening potential recently when cable television operator Tele-Communications, Inc. said it is accelerating its fiber backbone deployment to accommodate emerging interactive, large-bandwidth applications.

Tele-Communications in Englewood, Colo., said it plans to invest nearly $2 billion on the project during the next four years, which will include a total of 168,000 fiber miles to be installed this year alone. The fiber backbone will work in tandem with digital compression techniques applied to the "last mile" of coaxial cable running to most homes, in order to pave the way for applications such as telecommuting and educational, information and entertainment services.

The firm's fiber installation will affect 100 cities this year.

It is unclear yet whether the effort will spur fiercer competition or added cooperation from local telephone companies, which currently run lower capacity twisted-pair wiring to homes and are prohibited by antitrust legislation from offering phone and cable TV services

Cable TV, *page 52*

E-mail standards

Shell goes own way with directory database

By Elizabeth Heichler
LONDON

■ The Shell Group of companies has built its own electronic-mail directory database as a stopgap measure until international standards and products mature.

Electronic messaging is a critical application for the Dutch energy company, which is looking toward the international X.400 and X.500 standards to untangle the complexity of interconnecting its myriad electronic mail, fax and telex messaging systems. Shell manages some 30,000 E-mail addresses worldwide.

Built on top of its X.400-based Shell International Message Interchange Service (SIMIS) backbone, the company's homegrown directory database is only an interim solution because of the stress that increased local-area network-based E-mail traffic will put on the centralized system, explained Henk Reimers, consultant in message handling at Shell Internationale Petroleum Maatschappij B.V. in The Hague, Netherlands.

"Maintaining a central directory with the hundreds of LAN servers in a LAN-based E-mail system would be impossible," Reimers said. "We want directory management to be distributed rather than centralized."

Shell's commitment to international standards — it began work on its X.400 backbone in 1987 — combined with the demands on its worldwide messaging systems clearly dictate its planned migration to X.500 directory services, Reimers said.

Yet many products based on the 1992 X.500 specification are not available or are unproven, and time-tested products based on earlier versions of the X.500 standard lack key capabilities, such as access-management functions, he noted.

"Why are we not already doing X.500?" Reimers asked a recent gathering of the European Electronic Messaging Association in London. "When X.400 came along, Shell was among the first to jump in." With X.500, Shell does not want to repeat the experience of being on the "bleeding edge," working with products based on an immature standard.

Until Shell is ready to take the plunge, it will rely on its newly deployed central directory, called SIMIS Directory Information System (SIDIS), built on top of a relational database. SIDIS collects, distributes and processes E-mail addresses, acting as a central repository of directory information. It does not function as an active gateway, however, and thus cannot be directly interrogated by Shell's SIMIS software.

Local maintenance

The information contained in SIDIS is maintained by local supervisors, who on a daily basis update their E-mail gateways (for local systems such as IBM's Profs, Digital Equipment Corp.'s All-In-1, HP Desk and others) with changes to local user information. Once a week, the local E-mail gateways are updated with directory information from the SIDIS database. Built-in filtering mechanisms help ensure that each site gets only the addresses it needs.

While SIDIS does a good job of managing directory information from host-based messaging systems, it will not suffice as Shell's E-mail traffic becomes increasingly distributed across LANs, Reimers said. "Our biggest growth is LAN-based E-mail, such as Microsoft Mail and CC:Mail."

At Shell's Netherlands site, for example, there are 6,000 to 7,000 E-mail users on a host-based system, with addresses maintained in a single directory. Once the company moves to LAN-based E-mail, the system will be broken up into a collection of 20 or so "post offices," each maintaining approximately 250 to 300 users, Reimers explained.

The Shell Group's operating companies extend around the world, and the standard messaging system remains Shell Telex because telex remains the only reliable messaging system in some developing countries. Shell has implemented public telex gateways on SIMIS to transfer telex messages to X.400.

Heichler is an IDG News Europe correspondent.

Cable TV

CONTINUED FROM PAGE 51

over the same system. Similarly, cable TV companies are prohibited from offering telephony services via their networks.

"There are currently competing public policy issues," explained John Mansell, senior analyst at Paul Kagan Associates, Inc., a media analysis firm in Fairfax, Va. For example, legislators have not yet arrived at policies that can both dispel the threat of monopolies and reap the cost-saving benefits of consolidating cable TV and regional Bell operating companies' (RBOC) network infrastructures, he said.

Tele-Communications' fiber upgrade project will be extended to include more than 250 cities, towns and counties by year-end 1996, according to the cable television operator.

The situation is analogous to the efforts of alternative local access carriers such as Metropolitan Fiber Systems and Teleport Communications Group, which have gradually won interconnection rights with the regional telephone companies — their competitors.

"Arguably, it is more efficient to have just one wire to everyone's door," Mansell said.

However, Bruce Ravenel, Tele-Communications' vice president of technology, noted, "There is no clarity today in this political debate. And there are huge regulatory problems for cooperation to actually work, such as how to administer cross-ownership rules with the RBOCs operating under rate-of-return regulation and the [cable TV] companies not being regulated at all."

Tele-Communications has several joint trials with carriers in progress in the hopes that federal regulations will soon change. These include a $1 million joint trial with wireless giant McCaw Cellular Communications, Inc. for delivering cable TV and cellular telephony through a single box at a customer's site. In the Denver area, US West, a regulated RBOC, and Tele-Communications are immersed in a two-way pilot allowing users control with their TVs.

However, "these trials will require changes in FCC law" to be offered commercially, a company spokesman said.

Meanwhile, "gray telephony-based service areas," such as home shopping, banking and videophone service, exist where cable TV and phone companies might team up in the future, Mansell said. However, "it will be two to three years" before the phone companies will be providing cable TV and vice versa because of the regulatory brouhaha, he predicted.

HP, Microsoft announce E-mail link

By Lynda Radosevich

In the first of what are expected to be several such partnerships, Hewlett-Packard Co. last week announced that client software from Microsoft Corp. will run on HP's X.400-based electronic messaging server software.

HP said it will ship drivers that let Microsoft Mail Version 3.2 users retain that product's graphical interface and features while using HP's OpenMail, an X.400 standard messaging backbone. An HP official also said a similar agreement with Lotus Development Corp. should be completed soon.

"HP is not known as excellent for promoting its products, but the company is committed to openness and connectibility," said Walter Ulrich, Pacific Southwest director at Arthur D. Little, Inc. in Los Angeles. "This is a pretty prominent example of HP selling infrastructure products that allow companies to support the products of their choice."

Now, Microsoft Mail users can connect to an X.400 backbone using translation software or "gateways." However, that method traditionally has troublesome directory access and lacks features such as return receipts. Running mail as a native X.400 client on OpenMail will alleviate these problems, HP said.

"It sounds as if it would be easier to use an X.400 backbone without having to teach users a new interface," said James Song, a computer scientist at Computer Sciences Corp., a Microsoft Mail shop in El Segundo, Calif.

OpenMail runs on the HP 9000 series of Unix workstation and has recently been ported to IBM's RISC System/6000, Digital Equipment Corp. Ultrix and several other Unix platforms.

Internet

CONTINUED FROM PAGE 51

ternet Architecture Board.

Whatever the solution that is decided on, Chapin said, it must be backward-compatible to protect the investments of millions of users.

As the field tests unfold and as router vendors continue to increase the capacity of their machines to handle ever-larger routing tables, network administrators are being urged to employ CIDR, or Classless Inter-Domain Routing. CIDR proposes the use of new interdomain routing protocols that support the use of variable-length masks to identify the network number part of an Internet address.

"The best expert opinion tells us that with cooperation from network administrators, CIDR can hold off network-number exhaustion for at least two years [and possibly] until the end of the decade, assuming that the capacity of Internet routers ... continues to grow as it has in the recent past," Chapin said.

Varied uses

In a survey of 1,287 Internet users at IBM, 35% said they use the Internet to communicate with peers, 26% to communicate with customers, 10% for degree-oriented education, 9% to subscribe to external forums, 5% to communicate with government agencies, 4% to participate in standards activities and 11% for other purposes.

LOTUS cc:MAIL

Awards (1992-1993)

ComputerWorld I/S Brand Preference
Winner, February 1992

•

Windows Magazine WinAward, February 1992

•

LAN Times Reader's Choice, March 1992,
January 1993

•

InfoWorld Product of the Year, March 1992

•

BYTE Magazine Reader's Choice, June 1992

•

BYTE Magazine Award for
Cross-platform E-Mail, March 1993

•

Network Computing's Certified Interoperable
Application Award, December 1992

•

Network World's Enterprise
Technology Award, December 1992

•

Software Digest's Highest Overall Evaluation,
8.7 Rating, 1992

•

MacUser Editors' Choice Award, 1992

•

MacWEEK 1992 Editors' Choice
Diamond Award, December 1992

•

UNIX World's Best Product of the Year for
1992, January 1993

MICROSOFT MAIL

Awards (1992-1993)

PC Magazine Editor's Choice Award
October 27, 1992

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Lotus cc:Mail

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IBM Business Partner

Tales from the warehouse

Data warehouse is a central storehouse of data that is easily accessed and manipulated by end users from their PCs. It can take many forms, from enterprisewide data on a host computer to a departmental database on a small server that is used by a few people. In almost all cases, however, the data in the warehouse is separate from the production applications used to run the business.

By Johanna Ambrosio
WASHINGTON, D.C.

THERE IS NO ONE RIGHT WAY to implement a data warehouse, but there are plenty of mistakes that can be made along the way. Users recently gathered here to swap war stories and learn from one another about the myriad things that can and do go wrong.

The issues surrounding warehouses range from the technical to the managerial to the political. These challenges span all aspects of warehouse-building, from the design to the implementation and administration phase.

Among the challenges raised at the meeting were the following:

▶ How much, if at all, should the production applications that feed the warehouse be re-engineered?

This is a widespread debate, and, in many shops, it touches on political, cultural and technical issues all at once. The issue rears its head when it becomes obvious — usually fairly early in the design stage — that the data formats and names in the production applications generally do not match those required for the warehouse. Often this means the data in the warehouse environment is different from that in the production environment, which results in end users having to face two different sets of numbers for monthly sales, for example.

Users have adopted various solutions to this dilemma, ranging from not doing anything to change the production systems to re-engineering them completely.

US West Communications, Inc. in Boulder, Colo., was "not successful in re-engineering the operating environment," said Mark Johnson, a data warehouse planner. "We've gotten blown off the hillside a few times when we tried."

"Clean at the source" is the motto at the Salt River Project in Phoenix. "You have to identify and fix existing problems and create programs to stop the introduction of new problems," said John Chatfield, information warehouse architect.

In time, Johnson said, the success of the warehouse should cause end users to insist the production, or feeder, systems be re-engineered so the information matches on both sides.

A middle ground was taken at The Pillsbury Co. in Minneapolis. Ron Eldred, systems planning manager, said his firm was successfully able to re-engineer the consumer relations production application for the warehouse project servicing that group, but the other feeder production systems were basically off-limits.

"We took the position that the operational consumer relations system could and should be modified to capture cleaner data," he said. "But other systems were not in our control, and we had to accept any limitations as a practical matter."

Yet another tack is being taken at the Salt River Project in Phoenix, which essentially modifies all operational systems that require it. "Clean at the source" is the motto there, according to John Chatfield, information warehouse architect. "You have to identify and fix existing problems and create programs to stop the introduction of new problems."

"There is a learning curve for everyone, and . . . all that time, end users are breathing down your neck and wanting to see all this wonderful information you've promised them," said a warehouse planner at an insurance company.

▶ How do you avoid political imbroglios with the end-user community and the information systems staff?

In many user organizations, the people closest to the warehouse project are data analysts who design the warehouse and database administrators who help implement it.

Traditionally, these groups have been an offshoot of the IS staff. But warehouses require all factions to work together to interface the new applications to the production systems, and this does not always go easily.

"Real men do transaction processing, not decision support," is how Denver-based consultant Bill Inmon describes the tension. Warehouse is more a decision-support kind of environment and is not a transaction processing system to which IS can easily relate, he said.

But even more problematic than turf battles with the IS staff — and far more damaging — are political problems with the end-user community. Like most other technology projects, the ticket to warehouses is to get buy-in from the key executive in the area that will pilot the first warehouse application. But be careful of promising too much too soon, which is what happened at a Midwest insurance company whose warehouse planner requested anonymity.

"Data warehouses can yield real benefits in bringing information to end users in a way that they can use," the planner said. "But there is a learning curve for everyone, and it takes time to build the warehouse using structured techniques and to populate it with data from production systems. All that time, end users are breathing down your neck and wanting to see all this wonderful information you've promised them."

In his case, the political problems were even more severe than in other shops. "To get buy-in, our IS vice president ran through all the benefits and got commitments from all the line executives. Now they all want to be first. We have a new IS vice president, and everything is up in the air."

The message, the planner said, is this: "Be realistic in what you can do when and narrow the first application's focus down to something that will succeed. Then market the hell out of that success."

Many users agreed that the first warehouse application can take 12 to 18 months to build, with the pilot stage lasting three to six months after that.

▶ Management challenges: Once there are a couple of warehouse projects under way, how do you manage them and successfully seed them throughout the organization?

Whirlpool Corp. in Benton Harbor, Mich., started implementing a data warehouse in the third quarter of 1991. Two "major projects" later, it introduced a formal support organization to help manage what has now grown to some half-dozen initiatives. Laura Sager, data warehouse project leader, said the organization was announced last month.

At the top of the warehouse support structure is Whirlpool's corporate information technology group, for which Sager works. This central oversight group takes care of implementing new information types, looks into warehouse tools and platforms and rolls out warehouse initiatives globally.

At the second tier is the regional development centers — approximately five of them — which actually implement the projects and to which the individual project teams report.

Stumbling blocks

Issues commonly faced by users building data warehouses include the following:

- Balancing the business need for timely, complete information with the cost of providing that information. It is very expensive to build warehouses that are complete and totally accurate. For this reason, most users start small, typically with a marketing application that is well-defined.
- Dealing with political issues, such as trying to provide end-user access quickly even as the warehouse is being built.
- Deciding who owns the data — who defines it; who updates it.
- Figuring out what kind of data is needed and which operational systems it should come from, and then reconciling data names and other elements that are different from one production application to the next.
- Once the source of the warehouse data has been figured out, how do you get the data from production systems to the warehouse? Some automated tools are coming out to help populate the warehouse, but many users have had to write code themselves for this task.
- Security: Is the data provided to virtually any legitimate user who asks for it, or are there roadblocks built in?
- Who pays for the warehouse, and how (chargeback vs. up-front fee)?
- What kinds of end-user access tools should there be?
- What should you do about a catalog that shows end users the kind of information that is in the warehouse? Choices include building one in-house, buying one or adapting an existing data dictionary to the task.
- Separating the various elements of the warehouse architecturally, so one component — an end-user tool, for example — can be changed without having to rewrite everything.
- How much or how little should you rewrite the operation systems that are feeding the data warehouse?

— Johanna Ambrosio

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James M. Connolly

Impressive imaging

Sometimes technology's progress has to hit you in the face before you realize, "Hey, this thing is going places." That seems to be what's happened with imaging.

Imaging is the nephew who lives out of state, the one you haven't seen in five years. He was a scrawny, bratty 12-year-old when he moved away. Sure, you've talked to him on the phone, acknowledged his birthdays, followed his progress through high school and even seen pictures of him.

But suddenly one day, he parks his car in your driveway and walks into your house, and with the boom of his baritone "Hello, Uncle," you discover that you stand only chest-high to this onetime runt.

I hadn't been to the AIIM show in about five years. The major showcase for imaging is sponsored by the Association for Information and Imaging Management.

During those years, I'd seen plenty of imaging systems in product demos, on other show floors and at user sites, and I'd edited a million imaging-related product stories and user case studies. I knew the benefits users were getting from the technology, and I knew some of the neat new things that were coming down the road.

But none of that prepared me for a walk around the show floor in Chicago. Indeed, imaging is that 17-year-old nephew who may still be rough around the edges and not totally sure of his place in life but who is definitely growing up.

Imaging as strategy

Imaging is no longer a pilot project built around a proprietary software package that transfers images of contracts and checks from clunky optical jukeboxes to dedicated monochrome screens attended by people who could do little more than just look at them.

I remember talking with a guy from a federal agency a few years back. As he shook his head, he observed that those machines looked neat — but he couldn't justify spending that much money on something that really only allowed him to look at paper in a new way.

Imaging is more than that today. First, rather than being a technology or an industry, imaging is an element of the IS manager's strategy. It is the process of managing and presenting paper or film-based images as part of a broader application. Even if you don't accept the view of some vendors that an image is really just another data type, you do have to recognize that very few people are now building imaging systems the way insurance companies, banks and other paper handlers had to.

What is more likely to be built today is a system that allows a user to click on icons to read or send mail, to append notes to a document or to suggest changes in a design. Hidden under those icons may be "images" of documents that were scanned into the system.

The end users don't care that they are looking at an image. They care only that they can call up, read, deal with and forward a piece of their work. That means IS and the vendors have to provide systems that have images in them rather than imaging systems.

New standards

What was most amazing about the products at the AIIM show was that user-mandated technologies such as Microsoft's Windows, LANs, object-oriented development and links to existing applications were not features; they were givens. Even the makers of the most expensive enterprise-oriented products seemed to acknowledge that the products will go nowhere without these technologies.

I saw proof of how far imaging has come: Almost no IS folks were looking at optical drives. Instead, they were crowding in for a closer look at the software demos.

Where does imaging go from here? Watch for stratification in the next year or so. The folks with the high-end products, such as IBM and FileNet, should still do fine with their half-million-dollar systems. But some start-ups — including PaperClip Imaging Software, Watermark Software and Westbrook Technologies — are pushing products that allow workers with infrequent imaging needs to scan and handle documents such as contracts, memos and invoices for as little as $150 per user.

It remains to be seen whether the low-end products pack the horsepower that departmentwide work-flow demands. But one thing they should accomplish is to give more people a taste of what can be done with images, and that may bring yet another wave of users who want to make imaging a key part of their day-to-day job.

Connolly is *Computerworld*'s technical sections editor. His MCI Mail address is 597-1804.

Armco outsources to Genix

Flexibility, proximity cited as reasons for partnership

By Mark Halper
BUTLER, PA.

What is good for your affiliate is not always good for you.

That was the decision Armco Advanced Materials Co. reached earlier this year when it decided to outsource a portion of its processing to The Genix Group, even though affiliate Armco Steel Co. was tapping IBM's Integrated Systems Solutions Corp. (ISSC) subsidiary [CW, March 1].

Although ISSC offered a price competitive with the Genix offering, other factors weighed predominantly in Genix's favor, according to Ted Benham, general manager of information and automation at Armco Materials in Butler, Pa.

"With ISSC, we would be a very small customer, and our chance of getting special dispensation would be small," Benham said.

Armco's Ted Benham: *IBM would not deviate from its standard contract*

What sold Armco Materials on Genix was a greater sense of business partnership that the Dearborn, Mich., outsourcer provided. Genix's local presence (it anchors a strong regional operation with a data center down the road from Butler in Pittsburgh) helped boost the good partner vibrations, Benham said.

Furthermore, Genix was more flexible in contract terms and conditions, Benham said. He declined to reveal the value of the accord.

"We asked for several things, and IBM was reluctant to deviate from their standard contract," Benham noted.

For instance, Armco wanted a five-year deal, a duration to which Genix was amenable. IBM, on the other hand, offered a 10-year contract with a fifth-year withdrawal option, he said.

If that were not enough, Benham said ISSC seemed unwilling to run Armco's Digital Equipment Corp. systems.

"They indicated they would probably farm that part out to another company," he said.

So Armco Materials handed the job to Genix, which now processes the company's DEC VAX-based financial, payroll and trend analysis operations.

Armco Materials made its decision for good around the beginning of the year — after putting a scare in Genix last October by reconsidering a decision it had made earlier to go with Genix. That near change in course came when Armco Steel asked Materials if it would be interested in joining an outsourcing evaluation.

Armco Steel had declined to go outsourcer shopping with Armco Materials earlier in 1992 when Materials was beginning its considerations because back then Steel was not interested in outsourcing. But in October, Steel changed its mind.

Even though Benham's crew at Armco Materials already had begun to lay groundwork with Genix, it could not dismiss the new option presented by Armco Steel. "It possibly meant better pricing," Benham recalled, noting that by going in together, the two Armco operations might be able to leverage a contract with a more attractive price tag than the one Genix provided.

But it did not work out that way.

For one thing, Armco Steel wanted to negotiate an all-inclusive outsourcing deal covering multiple information systems facets including processing as well as application development. Armco Materials, on the other hand, was interested in selective outsourcing. Furthermore, the price break with ISSC did not materialize, Benham said.

So for the same reasons Armco Materials had earlier selected Genix, it decided to stick with it.

The new outsourcing deal is not Armco Materials' first with Genix. Armco tapped Genix in early 1992 to handle DEC VAX-based financial processing that Armco Materials was providing for its parent company.

The parent had asked the subsidiary to take over financial processing operations after a consolidation eliminated those operations in Middletown, Ohio.

In Brief

Data center consolidation

The **U.S. Air Force Materiel Command** awarded a five-year, $362-million contract to **BDM International, Inc.** to help consolidate 26 data centers into six centers in Dayton, Ohio; Sacramento, Calif.; San Antonio; Oklahoma City; Ogden, Utah; and Warner Robins, Ga. IBM mainframes will be replaced by Amdahl Corp. computers running Unix.

Unisys lands tax services contract

The **Swedish National Tax Board** has granted **Unisys Corp.** a $5 million contract to extend its tax collection and management services with a Unisys 2200/900 mainframe and an electronic-mail network based on Unisys' Mapper fourth-generation application development system.

Firms unite on weather product

Concurrent Computer Corp. and **Lockheed Missiles and Space Co.** announced an international agreement to jointly market and sell Lockheed meteorological products to weather system users. The turnkey meteorological software, called Lockheed MeteoStar, will run on real-time computer systems from Concurrent.

Sterling, Zebra make moves

In other product news, **Sterling Software, Inc.** in Dublin, Ohio, said it has ported its Gentran Unix EDI management and translation software to Hewlett-Packard Co.'s HP 9000. **Zebra Software** in Austin, Texas, released a development tool for connecting front-end Microsoft Corp. Windows 2.1 programs to HP and Digital Equipment Corp. multiuser systems.

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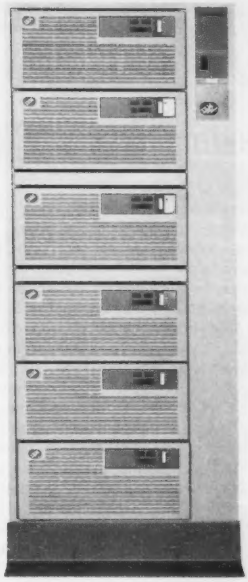

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Pyramid, Oracle work together on cluster

By Mark Halper
SAN JOSE, CALIF.

■ Pyramid Technology Corp. said last week that it has teamed with Oracle Corp. to develop a port of the Oracle 7 Parallel Server database that supports clusters of Pyramid boxes sharing the same database.

The multiuser Unix computer vendor also said it has created a support alliance program with database vendors and introduced a new "early warning" system management tool.

Through a combination of Oracle software and Pyramid software and hardware, Pyramid users can continuously access data in the event of a single processor crash within a cluster of Pyramid machines, said Alan Shoap, Pyramid's manager of distributed computing platform marketing.

Pyramid is now shipping the cluster, called Valence, and has been beta-testing it since last fall [CW, Sept. 28, 1992].

Pyramid's earlier cluster scheme, called Reliant, requires downtime when a processor fails. But unlike the Valence cluster, Reliant works with other databases, such as earlier Oracle versions, and programs from other database vendors.

Features added

Pyramid said the technology it added to enhance Oracle 7 Parallel Server's clustering capability included fault-tolerant distributed lock management, node interconnection, a high-availability array system and distributed disk mirroring.

It also developed what it called virtual Ethernet, which Shoap said is a layer of software that manages multiple Ethernet connections as a single logical connection. The Valence cluster runs on DC/OSX, a Pyramid version of Unix System Laboratories, Inc.'s System V Release 4 that is more standard than earlier Pyramid Unix flavors.

Pyramid set pricing at $200 per named user and $300 per concurrent user, following the same pricing model as Oracle's to avoid pricing confusion, Shoap said.

Meanwhile, the "affiliate support" program that Pyramid announced last week is intended to prevent users from getting batted back and forth as hardware and software vendors argue over responsibility for problems, said Lauren Ventura, Pyramid customer services marketing director.

Worth considering

Paul Ricker, vice president of IS at Pyramid shop G. Heileman Brewing Co., said Valence "is something we'll be looking at. [The enhanced clustering] would be a big advantage because today, if we have a problem with just one processor on a multiprocessor machine in a cluster, that machine is down."

The program is intended to better coordinate service to end users from Pyramid and its partners — Oracle, Ingres Corp., Informix Corp. and Sybase, Inc.

Paul Ricker, vice president of information systems at Pyramid shop G. Heileman Brewing Co., was receptive to the program. Support can involve "a lot of finger pointing" among vendors, he said.

"In the past, when there's been a problem, you could get Oracle saying it's Pyramid's problem and Pyramid saying it's Oracle's, and you end up in that eternal loop," Ricker said.

Separately, the new system management software, called ServiceExpert, was designed to provide early warnings of hardware and software errors. Pricing starts at $750 per month, depending on system configuration.

Bosch ships tape library

By Jean S. Bozman
BRIDGMAN, MICH.

Two German manufacturers are collaborating on a late entry into the American automated tape library market. Robert Bosch GmbH and Grau Automation GmbH are contributing the hardware and software to make a compact, high-capacity tape library that is being manufactured by Bosch Storage Systems, a Bosch division that makes robotics equipment.

The Bosch 8800 Automated Tape Library, announced last month, carries list prices from $250,000 to $1.5 million. The base unit holds 5,760 cartridges, slightly fewer than Storage Technology Corp.'s 4400 Automated Cartridge System (ACS), which established the market for IBM-compatible automated tape libraries in the late 1980s.

The Bosch unit is based on Bosch robotics and software from Grau, said Robert Farkaly, marketing director of Bosch Storage Systems, which has about 30 employees. Farkaly said the Bosch 8800 unit is two-thirds the size of a comparable Storage Tek tape-library silo.

The Bosch system can use tape drives from several vendors, Farkaly said. It is based on the stacking of ½-in. tape cartridges in several tiers; up to four robots can "pick" the tapes, he noted.

Investment protection

Bosch's main selling point is that it protects user investments in two generations of tape-drive technology, said Paul Wolfstaetter, a storage analyst at Gartner Group, Inc. in Stamford, Conn. He said Bosch's library accepts IBM's 3480 and 3490 drives, as well as those made by Storage Tek, Memorex Telex Corp. and Hitachi Data Systems Corp. Storage Tek and IBM libraries accept only one kind of tape drive, he said.

Bosch's late start means it will fight an uphill marketing battle against hardware giants IBM, Storage Tek and Memorex Telex. However, Wolfstaetter noted that Grau has installed 125 libraries in Europe and the Mideast. "Bosch will probably not become one of the predominant players," he said, "but they are answering a niche requirement."

Medical reform could spur IS spending

By Ellis Booker

How will the Clinton administration's proposed reforms to the health care industry affect hospital information systems departments? According to a recent survey, hospital IS executives suspect the changes will accelerate the advancement of information technology in health care.

This was one of the key findings of the fourth annual survey sponsored by Hewlett-Packard Co. and the Healthcare Information and Management Systems Society (HIMSS) of the American Hospital Association.

Eight in 10 of those surveyed said the proposed managed competition formula would have this affect; but six in 10 said it was unclear whether the administration's fiscal policies would allow hospitals to afford IS advances.

Reflecting the sentiment from earlier surveys, more than half of those polled said government and payee pressure to control costs is exerting the strongest pressure for computerization.

The impact on health care IS stemming from the Clinton administration's health care reform proposals come broadly from two areas, according to Andrew Pasternack, assistant director for publications at HIMSS.

First is the massive systems integration effort.

"The key to some kind of universal insurance plan in the U.S. is knitting together an incredible patchwork of public and private plans," he said, adding that this sort of integration has never been accomplished before.

A second impact will come from efforts to "drastically reduce" the administrative costs associated with delivering health care. In particular, tracking the clinical transactions will fuel development in such things as patient identification cards featuring microchips and bedside or portable computers for hospital staff.

Survey says:

Other results from the survey include the following:

- Seven in 10 providers of medical care said they expect a modest or substantial increase in IS expenditures in the next two years.
- A migration toward open systems architectures is evident. Nearly six in 10 said this is their fundamental strategy.
- Downsizing is not yet a watchword for the health care industry. Only four in 10 said they are downsizing their systems.
- As a group, the respondents expressed more optimism than they did just a year ago about the future of a standardized computer-based patient records system.
- The technology believed to have the greatest potential for improving patient care was, by far, clinical decision support systems for guiding diagnosis and therapy.
- A quarter of this year's survey respondents said they intend to invest in bedside computer systems.

The fourth annual HIMSS/HP Leadership Survey, conducted by J. C. Pollock Associates in Trenton, N.J., polled 571 health care professionals at the HIMSS conference last month in San Diego.

New Products

Utilities

Generic Software, Inc. has introduced the Change Management Facility, a full-function change management system for IBM's Application System/400.

The product offers a variety of features such as the ability to archive all source code as it is moved from the test environment into production and the ability to lock a production source to prevent multiple users from "checking out" the same program, according to the company.

A security module and a complete audit trail for all functions are also provided.

The product has a price tag of $995.

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Banner Software, Inc. has announced five new enhancements to its VM-based product, LIBR/VM.

According to the company, the enhancements consist of support of native VSE Cobol in CMS, linkage editing in CMS, compilation of VSE Cobol programs in CMS, execution of VSE Cobol programs in CMS and read/write security control.

All versions of VM and VSE are supported.

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Ease of Install/Upgrade	8.9	8.0	8.8	7.8	8.1	6.3
Price/Perform Return	9.1	8.3	8.5	7.9	8.1	7.4
FUNCTIONALITY						
Flexibility	9.1	8.8	8.6	8.4	8.4	7.6
Interface Capabilities	8.9	8.9	8.4	8.1	8.7	7.4
Comprehensiveness	9.1	8.8	8.8	8.3	8.7	7.6
User Friendliness	8.9	7.7	8.3	8.1	7.5	7.0
OS Compatibility	9.6	8.4	8.9	9.0	8.8	7.5
PRODUCT SUPPORT						
Documentation	9.0	8.2	8.6	7.4	8.2	6.8
Vendor Training	8.7	7.9	8.0	7.9	7.6	6.7
Problem Response Time	8.8	7.5	7.2	6.8	6.4	6.2
Quality of Vendor Support	9.0	7.8	7.5	7.4	6.9	7.2
Frequency of Releases	8.5	7.5	6.7	6.9	7.7	7.2
Response to User Request	8.8	7.5	7.8	7.6	7.0	6.5
OVERALL SATISFACTION	9.3	8.7	8.5	8.3	8.0	7.6

Compiled from the latest Datapro reports on DBMS/Computer System Series Software available for each product listed (for Informix, see Informix/SQL). All results are those of actual users of the product as surveyed by Datapro.

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Sorting capabilities	8.59	7.24	7.21	7.58
Provision for software security	8.00	6.23	7.00	6.70
Report writing capabilities	7.64	6.54	6.59	6.50
Ease of use of interface	8.13	6.89	6.85	6.50
Software integration capabilities	8.09	6.92	7.20	6.15
Ease of data retrieval	8.89	7.26	7.65	7.04
Satisfaction with product profitability	7.98	6.61	6.79	5.19
Overall quality of product	8.87	6.97	7.35	6.71
PRODUCT FEATURES AVERAGE	8.32	6.82	6.96	6.41
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Charges for training time	6.91	5.79	5.56	4.71
Provision for technical support	7.57	6.14	6.00	5.15
Provision for marketing support	7.04	5.97	5.33	4.04
Documentation & product information	8.62	7.03	6.57	6.00
Frequency of updates & revisions	7.75	6.26	6.05	5.74
SUPPORT FEATURES AVERAGE	7.86	6.32	5.93	5.18
OVERALL AVERAGE	8.11	6.65	6.62	6.00

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Bumpy road to client/server

Lack of integration between CASE and client development tools a problem

By Garry Ray

■ With all the hoopla surrounding client/server application development, you might think that integrating client programming tools into enterprisewide development is as easy as crossing the street. Not so.

While interest in client/server tools has heated up in the past six months — witness the initial public offering of Powersoft Corp. last month and the acquisition of tools vendor Matesys Corp. by Atlanta's KnowledgeWare, Inc. in February — developers might be well-served to look both ways before hitting the asphalt.

At the top of the problem list, according to a number of consultants, vendors and users of the technology, is the difficulty of using client programming tools in a structured, enterprisewide development effort.

That may not be much of a problem today because "people are buying low-cost, portable client/server tools to experiment," not to develop enterprisewide production systems, said Anthony Picardi, vice president of software research at International Data Corp. (IDC) in Framingham, Mass. However, "a year from now, users will find that they'll have to bring in full life cycle tools because client/server development is very complicated," he added.

In a recent study, Picardi found that only 10% of all the companies he surveyed worldwide are actually experimenting with the technology. Quixotically, "the percentage of companies committed to client/server increased from 22% to 25% during 1992," Picardi said.

Other companies may be in for a client/server shock, according to Ed Acly, director of software research at Technology Investment Strategies Corp., an IDC-affiliated consultancy in Framingham. Because client/server tools lack the capabilities of enterprisewide computer-aided software engineering (CASE) tools, "rude discoveries are going to be made by developers" about client/server limitations, Acly said.

Users ahead of the technology curve may find themselves at the end of a very long road but with no room to maneuver.

According to Acly, "We don't have any proof that the midrange client/server tools will scale up easily to more robust, enterprisewide applications" — the very applications they are said to address.

Happily ever after

The ideal marriage between upper-CASE design tools and client programming tools would allow developers to "move the CASE work down to the client, without a lot of re-engineering to be done in the client tools," said Paul Siegerist, president of Tulsa, Okla., systems integrator The dTech Group.

Siegerist, whose firm uses a wide variety of CASE, client programming and database development tools for projects in the natural gas industry, said the perfect scenario would allow entity relationship modeling using CASE, generation of SQL statements for a client tool and automatic insertion of the SQL into a client application. However, Siegerist said such a tool does not now exist.

"If someone says they have it, then I have a bridge in Brooklyn to sell you. Nothing out there does it," he said.

Still, Siegerist said a recent contract led to the use of KnowledgeWare's ObjectView client development tool. The application, which Siegerist said is "3M bytes of compiled ObjectView code," was created for an energy company that buys and sells natural gas contracts.

Patiently waiting

Although he was not using KnowledgeWare's CASE offerings in the project, Siegerist said he is familiar with the company's CASE tools and looks forward to their integration with ObjectView. "The way enterprise development is moving, most CASE vendors are moving to create an integrated symbiosis between CASE and client/server tools," he said.

KnowledgeWare President Donald P. Addington said last week, "The integration of ADW and ObjectView is one of our highest priorities." Integration with the Application Development Workbench Design and Analysis Workstations will be unveiled later this year, he said (see story page 82).

The lack of integration between CASE tools and client development tools may seem an intractable problem today but can at least be understood.

According to Farzad Dibachi, senior director of product marketing for Oracle Corp.'s Cooperative Development Environment initiative, "CASE companies don't know much about client/server, and client/server companies don't know much about CASE." The Redwood

Client/server, *page 65*

The CASE for integrated tools

Representative examples of upper-CASE tools supporting one or more integrated client development tools

	Upper-CASE tools	Client development tool(s)
Andersen Consulting	Foundation	Rapid Application Builder
Bachman Information Systems, Inc.	Bachman/ Analyst	Powersoft PowerBuilder
Intersolv, Inc.	APS	APS
KnowledgeWare, Inc.	ADW/Workbench	ObjectView
Oracle Corp.	Oracle Case	Oracle Forms Oracle Reports

CW Chart: Michael Siggins

Making the move

The shift to client/server is definitely on, according to an International Data Corp. survey. Of the 1,606 IS professionals surveyed, 22% said their companies have already implemented client/server systems, while another 12% said they plan to do so.

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Firm to ship 'Easy' CASE with rules, Windows

By Melinda-Carol Ballou
REDMOND, WASH.

Evergreen CASE Tools, Inc. will ship in June new versions of its low-cost EasyCASE Professional and EasyCASE System Designer with support for Microsoft Corp.'s Windows and rules-based design.

EasyCASE Professional is the company's core product. It offers a full chart editor, a data dictionary, reporting features and methodology rules.

EasyCASE Designer takes those capabilities and adds automatic schema generation for more than 16 dialects of SQL, as well as forward- and reverse-engineering for Xbase databases.

The products have now been "completely re-engineered from scratch" for Windows, and the DOS and Windows versions are compatible "down to the chart and data dictionary levels," said Sue Hutchinson, product marketing manager at Evergreen. "In this way, holdouts on DOS can work together with Windows users with our multiuser support."

Also new is support for rules-based design via a methodologies manager that sets methodologies used for a project and then enforces them.

"If someone tried to do something silly [or inconsistent], the product will catch the error on the fly and give them a message saying they can't do it and why," Hutchinson said. "It enforces rules as you build diagrams, hierarchies and as you define records and elements and entity relationships on the data side. This allows a team to use consistent design practices automatically."

EasyCASE Professional 4.0 and EasyCASE Designer 4.0 are priced at $795 and $1,195, respectively.

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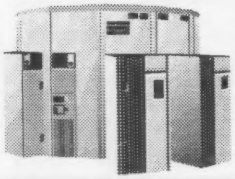

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In Brief

Cross-platform deal

Neuron Data, Inc. said **IBM** has signed an agreement to use the company's Open Interface cross-platform development tools to create and deploy commercial applications.

AS/400 CASE tool

System Software Associates, Inc. will be working with **Bachman Information Systems, Inc.** to develop an IBM Application System/400 version of the Bachman/Analyst computer-aided software engineering (CASE) modeling tool. The new tool, to be called AS/SET Bachman/Analyst-400, will work with System Software's current line of CASE tools for the AS/400.

Converting to tools

Following the trend of converting application development methodologies into software tools, **Coopers & Lybrand** in New York is now shipping Summit Process, which implements its Summit-D systems delivery methodology.

Cognos honored

Cognos, Inc. was named an IBM Business Partner/Cooperative Software Supplier, offering its PowerHouse fourth-generation language to users of IBM AS/400s.

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Bumpy road to client/server

CONTINUED FROM PAGE 63

Shores, Calif., database vendor is probably an exception among tools vendors because its CASE offerings and client tools all share the same repository — an Oracle database.

Such an integration gives Oracle the potential to weld CASE and client offerings together.

No surprise

That companies are making a commitment to client/server technology without benefit of a trial run is not necessarily surprising to Don Dall, managing director of the Foundation group at Andersen Consulting in Chicago.

Dall, who said client/server technology "runs best on an overhead projector," also noted that client development tools can provide an impressive turnaround in requested applications. But the domain of client/server tools and applications is very limited, he said.

"The client side is all focused on building a window tied to a specific database," he said, not on larger projects crossing multiple distributed databases with hundreds or thousands of users.

Approaches to integration

Client/server tools vendors have just begun to recognize the need to provide links to a variety of upper-CASE products. While the list of offerings is growing as users request more robust client/server programming environments, two of the more prominent examples are being set by Powersoft and Oracle.

Although they have conflicting definitions for "open development environments," both companies hope to enlist third-party CASE vendors to supplement their own client development tools.

The foremost example in the client development tool area is Powersoft, which has announced alliances with Bachman Information Systems, Inc., LBMS, Inc., Intersolv, Inc., Popkin Software and Systems Corp. and other prominent CASE vendors.

Behind Powersoft's business partnerships are two initiatives that add technical substance to the marketing arrangements.

First is Powersoft's Client/Server Open Development Environment (CODE). Largely a statement of intent, CODE promises open application programming interfaces (API) to PowerBuilder functions, libraries and the PowerBuilder repository.

The Open Repository CASE API subset of the CODE initiative has already been embraced by at least one CASE tool vendor. Last September, Bachman said its Bachman/Analyst database development tool would be enhanced to develop database specifications to populate the PowerBuilder repository. Although business logic must still be written in the PowerBuilder editor, Bachman officials said the technology reduces overall development time.

Portable programming

Oracle has taken an approach that, while it remains proprietary, may be made available on a selected basis in the future, according to Oracle officials.

Called Cooperative Development Environment (CDE), the technology places a portable programming layer and API on top of a number of platform interfaces, including Apple Computer, Inc.'s Macintosh, Microsoft Corp.'s Windows, the Open Software Foundation's Motif and OpenLook.

Client tools written to use the CDE can access the Oracle repository and, therefore, models created by upper-CASE tools such as Oracle's Entity Relationship Diagrammer.

Information in the Oracle repository can also be shared by Texas Instruments, Inc.'s Information Engineering Facility and KnowledgeWare's Information Engineering Workbench.

Although the CDE interface is currently used only by Oracle tools, Farzad Dibachi, Oracle senior director of product marketing, said the company has "disclosed [the CDE programming interface] on a case-by-case basis" to some Oracle customers.

— Garry Ray

Making a CASE for client development

At Florida Power Corp. in St. Augustine, Fla., manager of technical services Don Higgins said the utility's ambitious customer service application could not possibly be brought to completion using client-only development tools. When it is delivered next year to nearly 1,000 customer service representatives, the application will have about 500 windows. Currently, the project has populated Foundation's repository with approximately 30,000 objects, according to Higgins.

While Higgins said client tools are useful in small-scale development efforts, he explained that they would not have worked with the massive, long-term migration to client/server now being planned by Florida Power. "Upper-CASE tools are fundamentally required in the long haul to make client/server work," he said.

With more than 22 years' experience in information systems, Higgins was not prepared to select tools that would limit the project over the long term. "We were looking for a vendor which could tie the pieces together within a single repository," he said.

But there are reasons other than integration that some development shops hope CASE vendors will supply workable client development tools: sheer familiarity.

Peter Van Hoof, a systems specialist at Great Western Bank in Northridge, Calif., said his shop's experience with a mainframe version of Intersolv, Inc.'s APS application generator was reason enough to consider it for client/server development. "I like the philosophy of Intersolv. It's not overly sophisticated, but it's practical," he said.

Under Van Hoof's direction, Great Western's loan origination department will get a pilot application for testing. Van Hoof said the greatest appeal of the APS tool is that "there will be only one program entity to maintain" for both terminal-based and client/server implementation. The bank has about 3,000 terminals for mainframes.

Aversion to hand-coding

In addition, Great Western's experience with CASE tools and application generators has created a strong aversion to hand-coding any applications. Van Hoof said, "We don't go down and twiddle code. I'd start cutting fingers off if that were the case." But he also saw the aversion in practical terms. "If I have to touch the code, it totally defeats the purpose of having a CASE tool," he said.

Such users are showing CASE vendors what is really demanded in enterprisewide client/server application development. Like Don Dall, managing director of the Foundation group at Andersen Consulting in Chicago, some CASE vendors have begun to realize that "it is our obligation to provide client/server tools with the same flexibility" as popular client tools, such as Powersoft Corp.'s PowerBuilder. Otherwise, Dall said, "some companies will be going down an alley with no way out." *— Garry Ray*

Digitalk ships Smalltalk extension

By Kim S. Nash
LOS ANGELES

Digitalk, Inc. last week shipped an extension to its Smalltalk object-oriented development language designed to address some of the pitfalls of group-based software-building projects.

Team/V lets several programmers define, store, browse and share Smalltalk "packages," which are modules of source code that define a program's functions or elements. The $1,495 product also helps manage those packages as developers work on different parts of the same application.

Southern California Gas Co. has built several small accounting and contracts-tracking applications with Smalltalk during the past year, but a lack of workgroup-based organizational tools had locked Smalltalk out of bigger initiatives, such as customer service projects, according to Arun Kiri, senior analyst at Southern California Gas.

"Smalltalk has been a single-workstation tool, which has kept developers of large applications from embracing it. We see promise in Team/V," Kiri said. Kiri, who is part of a group that evaluates tools for the Los Angeles-based utility, explained that Southern California Gas plans to stop all DOS development, instead of targeting IBM's OS/2, using Smalltalk.

Key pieces

Package Browser for creating and organizing data and process definitions; browsing function classes by category and identification information associated with definitions.

Definition Organizer for viewing, moving and swapping definitions.

Version Management and Access Control for managing packages stored on multiple repositories.

Pros and cons

Fifty to 70 developers work in groups to build client/server software for the utility. Having tested Team/V on a small chunk of a planned customer service application, Kiri has seen the good and the bad of the tool.

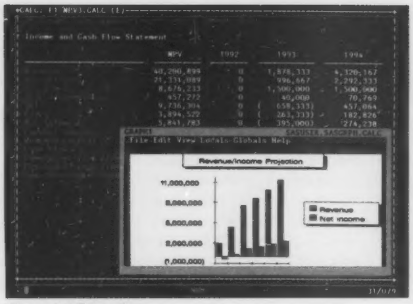
For example, Kiri said he likes Team/V's ability to let different developers work on various parts of a program in progress simultaneously.

Plus, he said that Team/V is a "fine" way to add a control layer between application analysis and code generation. "It helps us track who's doing what and when," he said.

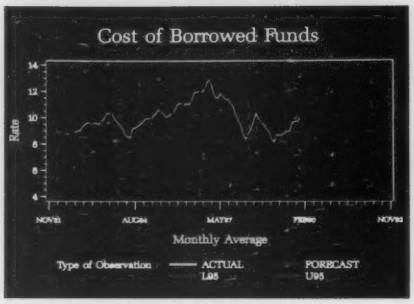
However, Kiri noted that there appear to be some small compatibility problems with Team/V and Parts, another Digitalk Smalltalk utility for creating reusable objects.

Specifically, transferring objects between the two tools has sometimes been bumpy.

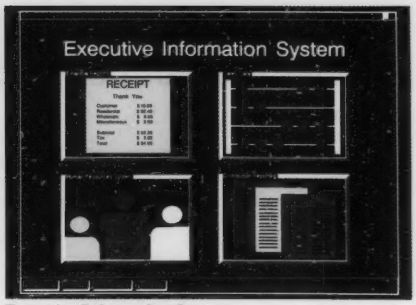
"We're not sure whether it was us or them, but we're working with the vendor on it," Kiri said.



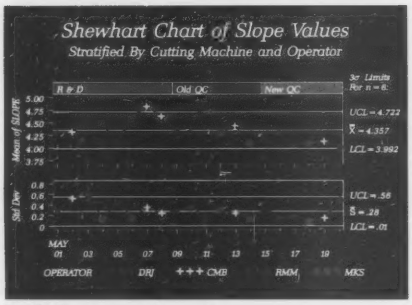
Financial Planning



Econometric and Time Series Analysis



Executive Information Systems



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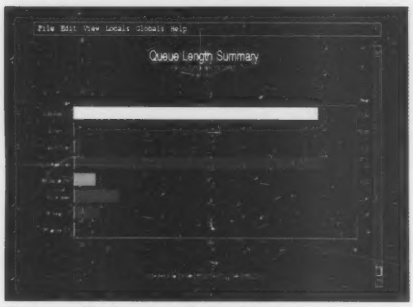
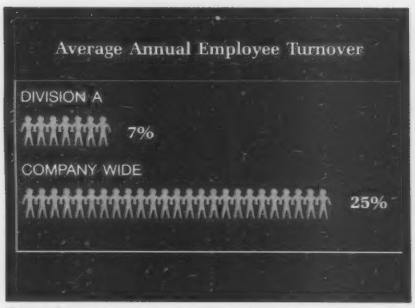


Computer Performance Evaluation



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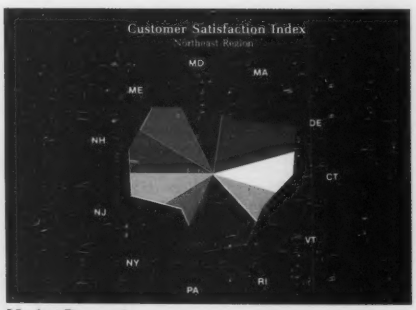
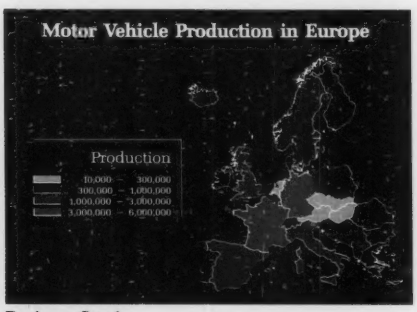
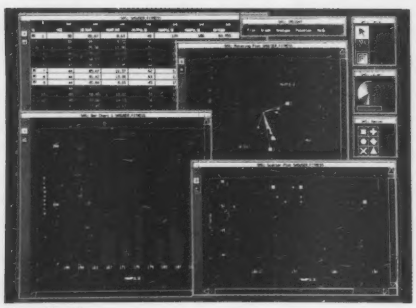


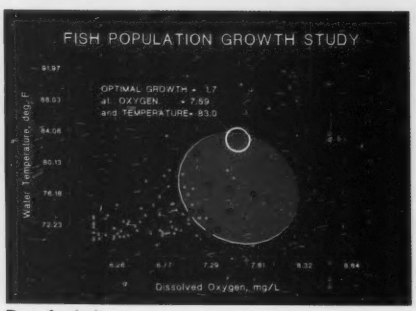
Market Research



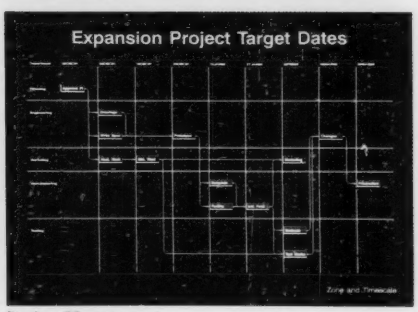
Business Graphs



Visualization



Data Analysis



Project Management

After a decade of business focus, the pendulum is swinging back to technology. IS execs, get ready for the

TECHNO renaissance

▶ **Mitsubishi's Esther Delurgio:** *Informal get-togethers with peers help her keep up with new products, issues*

By Alan Radding and Joseph Maglitta

Bears that get lost in the woods. Preachers who misquote the Bible. Chief information officers who don't understand technology. What's wrong with this picture?

Since the late 1980s, technology bosses have been encouraged to "learn the business" in order to be more effective. Ironically, many have let their technical skills slip, sometimes so badly they end up losing their jobs or steering their firms down blind, often expensive, alleys.

"Many CIOs have lost their grasp of technology," Patricia M. Wallington, Xerox Corp. vice president and CIO, told attendees at a Society for Information Management (SIM) conference in Rancho Mirage, Calif., earlier this month. CIOs, she says, "have focused on administrative tasks and paper shuffling. Many have not kept abreast enough to be the technology expert in the company, or at least at the awareness level."

However, a growing number of consultants, corporate executives and information systems professionals say a solid understanding of technology is once again becoming crucial for CIOs and other top IS managers.

Strong technical expertise is crucial, they say, for helping companies absorb new technologies and approaches such as mobile, distributed and object-oriented computing into a new data infrastructure for the 21st century.

INSIDE
Survey of "best practices."
Page 72

Few suggest CIOs trade their suits and power briefcases for programmers' jeans and moccasins. In fact, many say it's more crucial than ever that IS align itself with corporate goals.

But increasingly, that means acting as a technology adviser on a cross-functional corporate team tackling re-engineering or other key projects. So more experts say they believe it's time for technology chiefs to get back to their roots while keeping an eye on organizational goals.

"The CEO wants to know how certain technologies will impact the business," says Bruce Rogow, a Gartner Group, Inc. fellow and independent consultant in Marblehead, Mass. Unfortunately, says Rogow, who has been

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Techno-Renaissance

CONTINUED FROM PAGE 67

calling for a new focus on technology for several years, that is a question "a lot of CIOs can't answer."

If anything, demand for IS leaders to act as corporate technology experts only seems likely to increase. A recent *Computerworld*/Andersen Consulting survey of 203 top corporate officers ranked technical expertise as *the* most desired skill for CIOs [CW, April 19].

"Technology is changing dramatically," notes Bruce Marlow, chief operating officer at Progressive Corp., a Columbus, Ohio, insurer. "To find people who are very proficient with central IS systems technology *and* client/server technology *and* emerging Windows applications *and* operating systems in a client/server world — that's a hard thing to find," he says. "You have to be able to make those choices across all the different options that are available today."

Barry Clemson, director of the Change Management Network and associate professor at Old Dominion University in Norfolk, Va., adds: "There is a realization that we need to make better, more effective use of PCs, LANs, databases — that we need a framework to tie all this technology together."

Rogow says the renewed emphasis makes perfect historical sense: It's the latest pendulum swing between technology and business that has marked IS for the past two decades (see chart).

How IS has changed

Key business, technology and management issues have changed drastically during the past two decades. Today's fast-changing environment has swung the pendulum for IS management back to a heavy technological focus.

TIME FRAME		MANAGEMENT STYLE
1972	■ Build systems, select technology	■ Technical
1973-1978	■ IS management infrastructure	■ Operating manager
1978-1983	■ IS strategy, focus of IS	■ Business/Technical process planner
1984-1988	■ Business responsiveness	■ Business/Politically oriented
1989-1992	■ Alignment, value	■ Marketing
1993-	■ Technical architecture	■ Technical/Business leadership

Source: Bruce Rogow/Society for Information Management

Rogow wrote in a recent paper called "Putting The T Back Into IT" that in the early 1970s, computer professionals needed a technical management style to cope with emerging new technology and expanding business architecture. After the great upheavals in the 1970s and '80s, Rogow says, the situation reversed, making way for new business and technology platforms that have recently emerged.

"Technology isn't changing any faster than before," he says, "but the underlying platform is changing, and that makes all the difference." The new approach hinges on "middleware" — technologies, strategies and standards that enable interoperability among a variety of new and existing systems.

"The CIO has become the organization's chief information *infrastructure* officer," says Bud Mathaisel, director at Ernst & Young's Center for Information Technology and Strategy in Boston.

Rogow concludes: "The 1990s are starting with the almost total collapse of the IT platform. IS leaders will spend the next decade responding to business needs and 'rearchitecting' lagging technical resources."

How to keep up

The renewed focus on technology and architecture begs the question: How are busy IS executives supposed to keep up with the hugely complex new world of technology *and* their own company *and* their industry *and* organizational politics? IS heads concur: It's a Herculean job.

Craig Goldman, CIO at The Chase Manhattan Bank NA in New York, agrees that one of his main tasks is relating technology to business needs and potential opportunities. But, he says, "It is impossible to keep pace with everything."

Yet faced with a turnover rate pegged by a recent Deloitte & Touche survey at 25%, CIOs will need to keep their hands on to avoid losing their heads.

Experts say technology chiefs don't need to know, for example, every router on the market. But they must have at least a broad overview of the technology landscape to lead effectively.

So what does this new species of CIO look like? Probably similar to William Murray, director of IS at Tribune Broadcasting Co., an entertainment conglomerate based in Chicago. Murray has two jobs: Besides his CIO duties, he is the director of strategic technology.

The dual titles, he says, force him to spend his day differently than do peers with more traditional roles. "Fully 50% of my time is supposed to be spent as a hands-on participant in advanced technology projects," he says.

That participation often takes the form of the lead researcher in technology evaluation. Murray spends the other half of his time managing the company's existing information systems.

Or consider Ron Brzezinski, a Coopers & Lybrand partner in Chicago and former CIO at Quaker Oats Co. He says the importance of technology in a CIO's job depends on the firm, its needs and how it views the position.

If the CIO is perceived as a change agent, Brzezinski says, most likely the emphasis will be on knowing the company business. But if the CIO is seen as creator and custodian of the information infrastructure, the balance shifts toward a greater emphasis on technology.

Tips for techno-literacy

So how does an IS honcho become a Renaissance man or woman? Obviously, different strategies work for different individuals. But the following tactics have proved successful for some IS managers.

• **Networking:** Esther Delurgio, vice president of IS at Mitsubishi Motor Sales, Inc. in Cypress, Calif., depends on a group of local colleagues to keep her current. "We get together every few months at one or the other's companies to exchange information," she explains. Recent talks have focused on rightsizing and client/server technologies.

• **Inside job:** Some CIOs get experts inside the company to help them keep their technnology skills sharp. "My biggest source of information is people in the company who have expertise in a particular subject," says John Alexander, CIO at Unum Life Insurance Company of America, Inc. in Portland, Maine. Many CIOs also report that they depend on subordinates to keep them informed about new technology.

• **Read, read, read:** Literature — magazines, journals, periodicals, books — is the best source for keeping abreast of changing events, Brzezinski says. But he adds that "a lot of IS executives don't know how to study the literature" and get buried in details. Instead, he encourages them to skim, browse and scan material, looking only for relevant and interesting information.

• **A little night programming:** Some IS managers swear there's nothing like actual programming to keep skills sharp. For hands-on experience, Alexander has been experimenting with Smalltalk, an object-oriented language that presents a vastly different programming experience than what he's used to. "It's like falling down the rabbit hole," he says, but acknowledges that it keeps him up to date.

Warren Harkness, director of information services at Bose Corp. in Framingham, Mass., also pounds the keyboard to keep sharp. A heavy Apple Computer, Inc. Macintosh user, Harkness likes to try new technology. "I will always offer myself as an alpha- or beta- [test user] for certain applications," he says. Those include teleconferencing, electronic mail and data access software.

• **Trade associations:** Reviews are mixed on using formal groups to keep up with technology.

"Associations are bad news for keeping current," Brzezinski says. While associations may be great for networking, the technology insight they offer typically has the depth, for example, of a faxed survey to members on PC use, he says.

Harkness, president-elect of SIM, disagrees. "Formal affinity groups are one of the best ways to keep up," he says.

Delurgio agrees. She is active in local SIM activities and attends Guide and Share (IBM user group) events in her area.

• **Be wary of vendors:** For years, IS executives got much of their technical information directly from computer hardware and software companies. Buyers today are much more skeptical. "Don't go to your favorite vendor," Brzezinski warns, saying vendors are often just as much in the dark as you are. A possible exception: specialized firms that represent very specific areas of expertise, he adds.

Still, Goldman says he tries to familiarize himself with the technologies he believes are key to the bank by attending vendor briefings. His hands-on experience is limited to evaluating end-user products.

• **Consultants:** Consultants pose another problem because, according to some, they discourage CIOs from thinking for themselves.

"The CIO wants the consultant to neatly package a report giving him the real message, but there is no single real message," Brzezinski explains. Instead, he recommends that the CIO play what-if with the material. "He needs to let his mind run," he says.

Mathaisel adds: "There is no substitute for intelligent, alert people staying in touch with the patterns of things going on around them."

• **Training:** Top IS execs are also budgeting for-

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ROGOW'S RULES

Effective time management requires some ground rules, says independent consultant Bruce Rogow. CIOs today spend the bulk of their time talking to business managers and working on budgets, he says, so although technology is important, keep it in balance.

5%

of the CIO's time should be spent actually using new technology. "They need to struggle a bit with Windows or Unix to find out what it is like," Rogow says.

20%

should be spent on decision-making and setting direction.

25%

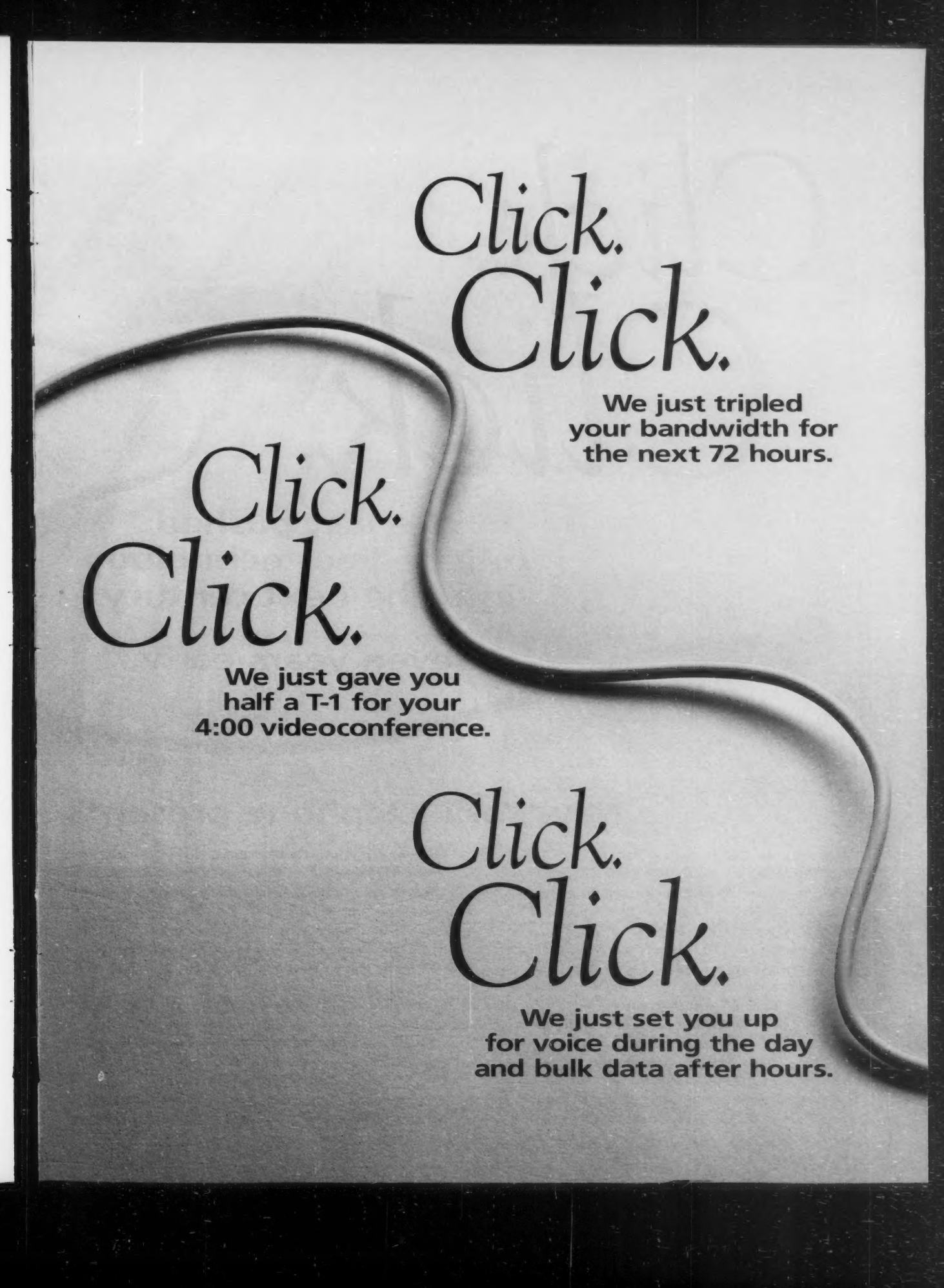
should be spent reconceiving the IS role and management process to reflect the latest technological changes.

25%

should be spent learning the end-user businesses.

25%

should be spent educating the company on the new technology possibilities.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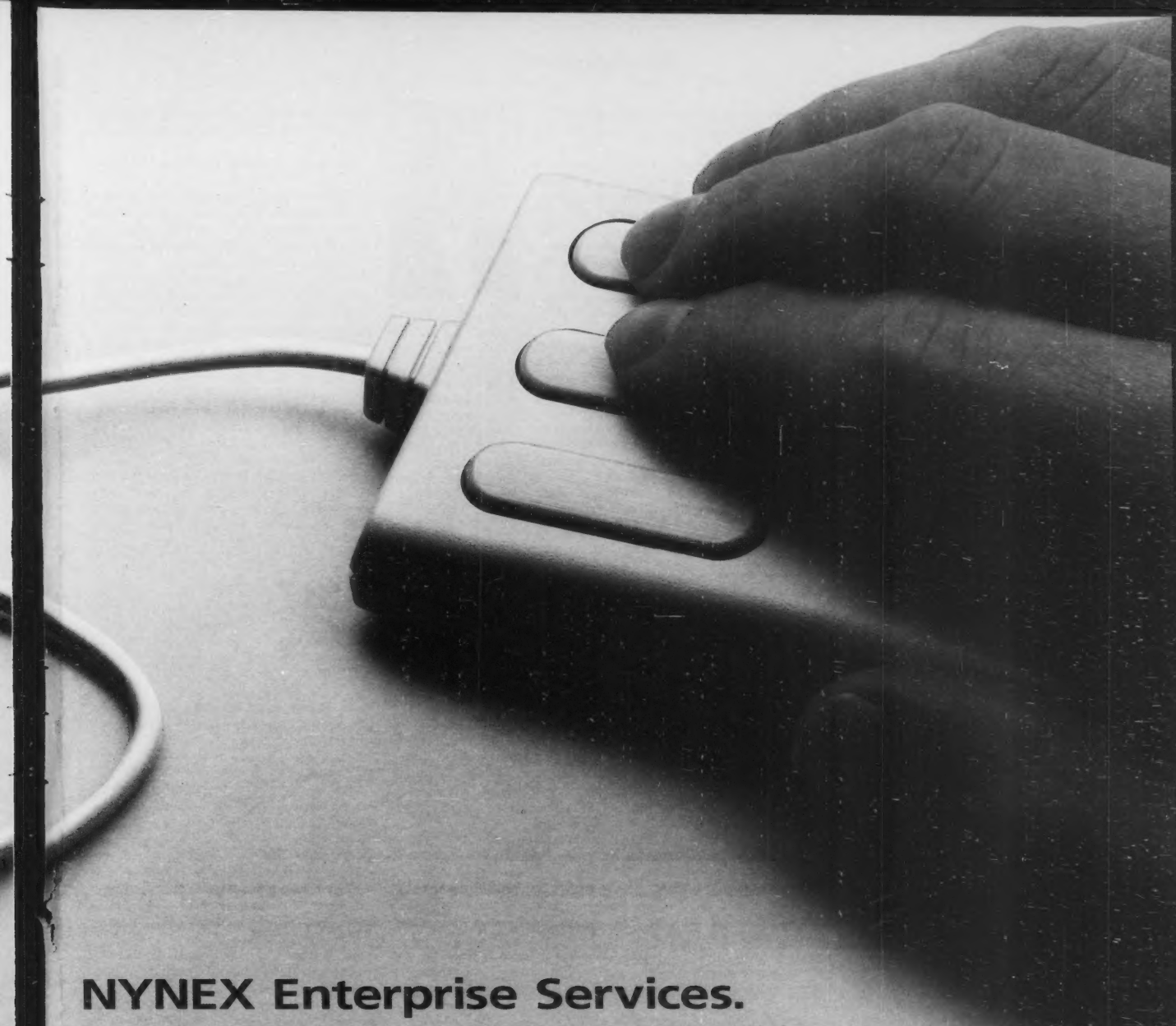

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Techno-Renaissance

CONTINUED FROM PAGE 68

mal education time to catch up on technology.

Dave Barrett, vice president of information technology at Investco Funds Group in Denver, says a major downsizing project has demanded his attention for the past two years, causing him to neglect his education.

He intends to get caught up on the latest developments by attending seminars and sitting in on training sessions about products from Oracle Corp., among others.

For example, he has budgeted education funds for himself and his entire IS staff; he spends some of that money to bring in experts for detailed, one-day briefing sessions.

What next?

Some consultants say the renewed emphasis on technology will serve CIOs well as they assume a new role in their organizations.

Michael Ashmore, vice president at CSC Index, Inc. in Cambridge, Mass., says the CIO's new role will increasingly be to teach business units how to use technology to realize the company's potential.

One challenge ahead will be to see if organizations can set up a stable role for CIOs. "Many companies are caught in the pendulum swing, from the techie who can't run a business to the general businessperson who doesn't know spaghetti code from pasta," says Dean Meyer, president of NDMA, Inc. in Ridgefield, Conn., an IS management consultancy.

Some note that CIOs are faced with seemingly insurmountable pressures to master business and technology. "Nobody can be all these things," says Bob Wilson, a principal at Praendix, Inc., a consulting firm that specializes in matching skills with jobs. His solution? Hire someone to supplement areas you're weak in.

Of course, many also caution that it's unwise to go overboard on technology and discard the valuable focus on business that has taken root during the past few years. Balance is key, they say.

Wallington compares the CIO's role to a rope with three strands: business, technical and organizational acumen. "The rope is as strong as those three strands," she says. "If you do an effective job as a CIO, that rope can be used for a lot of things."

"Many CIOs have lost their grasp of technology. They have focused on administrative tasks. Many have not kept abreast enough to be the technology expert in the company."
—Patricia M. Wallington, Xerox

She counsels IS people to create a technology vision that can be turned into action through careful interplay of the three key elements.

How long the technical focus will continue is anyone's guess. But Richard Swanborg, a consultant at Ernst & Young, offers an anecdote that hints at future directions.

Recently, Swanborg says, he received a call from a New York financial services firm that was looking to hire a chief technical officer who would not only oversee IS but also set vision and direction for corporate technology growth. Salary: $300,000.

Two weeks later, Swanborg says, he received an almost identical call. A Boston-based financial services firm was hiring for a position with an almost identical job description. Salary for this job: $800,000. "I started updating my resume," Swanborg jokes.

Even during the heyday of lofty CIO talk about business aspirations, the best CIOs always kept a close eye on the technology. The smart ones are now opening the other eye, too.•

Study: Users key to system development

By Michael L. Sullivan-Trainor
PALM SPRINGS, CALIF.

Forget relying solely on technology to speed systems development. A new study reveals that good organization structure and user involvement are the most powerful development tools.

That conclusion is among many contained in a study of 25 information systems organizations conducted by consultancy Ernst & Young and the Society for Information Management (SIM). Released earlier this month, the report focuses on isolating "best practices" that could give benchmarks for top IS performance.

> There are no silver bullet practices.

"We want real-life examples of what's working," explained Warren Harkness, SIM president-elect and IS chief at Bose Corp. "We want to know the best practices and then have the analytical horsepower to document them."

Best of the best

Some 50 "best practices" were identified by the survey respondents. But Richard Swanborg, director of Ernst & Young's Center for Information Technology and Strategy IS leadership program, warned that a practice that works for one company may harm another. "There are no silver bullet practices. The best thing to do may be to use a composite of practices that together provide a better process for your organization," he said.

In application development, the study found that tools such as computer-aided software engineering products, relational databases and workstations often help deliver systems more quickly and cheaply than traditional techniques.

The right touch

But the study found that "high touch" approaches such as cross-functional teams and prototyping lead to fewer application defects and higher user satisfaction.

The 100 or so SIM members who attended Swanborg's presentation responded favorably to the report and offered their own experiences with best practices.

Ray Hoving, director of MIS, process systems group at Air Products & Chemicals, Inc., vouched for the success of Rapid Application Development (RAD), which Swanborg ranked 13th on the list of best practices.

Hoving said his firm's use of RAD will reduce application delivery from nine months to only four, then to nine weeks. He cited a recent example of a four-week application that helped his group qualify for ISO 9000 certification.

The joint study, Harkness said, was the first phase of a three-part effort to establish best practices benchmarks. The next survey is being distributed to all SIM institutional members. Data from 50 to 60 respondents will be included in the final report. All SIM members will be included in the third phase, which will cover IS infrastructure.

Calendar

MAY 9-MAY 15

Advanced Topics in DB2. Toronto, May 10-12 — Contact: Barnett Data Systems, Rockville, Md. (301) 762-1288.

Eastern Communications Forum (ECF). Washington, D.C., May 10-12 — Contact: ECF, Chicago, Ill. (312) 938-3500.

Micro Focus Users Conference. Orlando, Fla., May 10-12 — Contact: A&R Partners, Redwood City, Calif. (415) 363-0982.

Systems Support Expo. Boston, May 11-12 — Contact: Bill Springer, United Publications, Inc., Yarmouth, Maine (207) 846-0600.

SunWorld '93. San Francisco, May 11-13 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

UCLA Information Systems Associates Symposium. Los Angeles, May 12 — Contact: Ginny Hyatt, University of California at Los Angeles, Los Angeles, Calif. (310) 825-1879.

1993 Boole & Babbage User Group Conference. Las Vegas, May 13-14 — Contact: Boole & Babbage, Inc., Sunnyvale, Calif. (408) 720-0231.

Independent Computer Consultants Association Conference. Tarrytown, N.Y., May 13-16 — Contact: Independent Computer Consultants Association, St. Louis, Mo. (314) 997-4633.

MAY 16-MAY 22

ICA ComNet Dallas '93. Dallas, May 16-20 — Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

Wireless DataComm '93 Exposition and Conference. San Jose, Calif., May 18-20 — Contact: Communications Events, Inc., Norwalk, Conn. (203) 847-5131.

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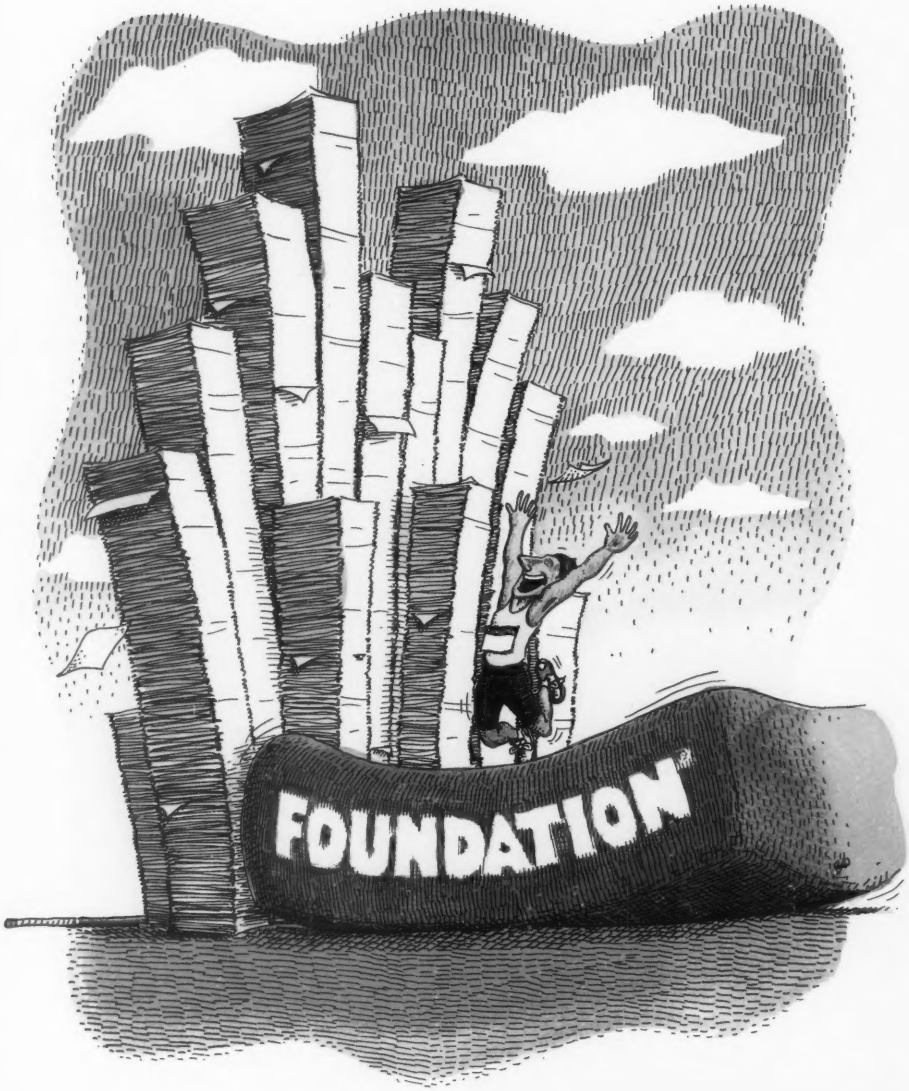

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Client/server development tools for WINDOWS

By David Baum

Client/server tools have exploded as quickly as Microsoft Corp. Windows itself, with a plethora of new products and diversification of existing products. On the surface, all vendors sound the same as they court customers with all the right buzzwords. But tools differ widely in their ability to develop complex applications.

"Tools tend to serve a particular constituency and a particular type of application," says John Rymer, an analyst at the Patricia Seybold Group in Boston. "Once you get beyond the bounds of that positioning, you have to use a different product, often with very little resemblance to the product you started out with."

Most organizations end up selecting two or more tool sets: one for smaller, Windows-only applications and others for large, multideveloper projects that span Windows and other operating environments.

They've proved themselves in pilots and simple applications, but many question how well these tools will perform in more complex environments

The lowest level

The lowest level client/server tools, known as graphical user interface (GUI) builders, are really just interface builders. These "frontware" products enable developers to create GUI front ends, complete with dialog boxes, buttons, scrolling bars and pull-down menus for existing mainframe programs.

Mainframe code doesn't have to be changed, so it's a good solution for firms that simply want a friendlier front end. The downside is that most of the instructions for sending, receiving and editing data must be coded by hand using an embedded third-generation language (3GL).

Many of the 3GLs themselves have taken on extensions to make them client/server-ready. But these languages — at least as they pertain to Windows — are still fairly new and, to some degree, unproven.

"We are still probably six months to a year from seeing the robust 3GL tools and class libraries that will form the foundation for industrial-strength applications for the desktop," says Dan Shafer, editor of the "Inventive User Letter" and president of Graphic User Interfaces, Inc., a consulting firm in Redwood City, Calif.

The Visual Basics

A step up in complexity leads to Windows development environments, such as Microsoft's Visual Basic and Borland International, Inc.'s ObjectVision. Like the GUI builders, these tools automate the interface creation, but they also add libraries of functions that programmers can easily embed in their applications.

These products are hard to beat for building tactical applications quickly. You simply draw the user interface and attach code that responds to events in the GUI. But a development team will be frustrated if it tries too much with one of these simpler Windows products, particularly when it comes to relational database

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Buyers' Scorecard: Uniface rates highest satisfaction. **Page 80**

Voice of experience: What it's really like to use these tools. **Page 77**

Client/server tools

CONTINUED FROM PAGE 73

management system processing.

For example, Visual Basic queries are coded in Basic; to connect with a SQL database, a translator turns the query into SQL. This isn't a problem for a simple application that accesses a few database tables, as is typical with most tactical departmental systems. But it can get extremely time-consuming for more complex corporate applications, where 50 or 100 tables might be involved, with numerous joins among them.

"Tools such as Visual Basic are really only a pixel deep," Shafer cautions. "They require developers to program the underlying logic of an application, as well as all the database transactions."

More sophisticated Windows development tools, such as Powersoft's PowerBuilder, KnowledgeWare, Inc.'s ObjectView and Gupta Corp.'s SQLWindows, include a 4GL to simplify the coding process in each of these areas.

The focus of tools such as Visual Basic and ObjectVision is on building decision-support systems within the PC client framework. Some are more Windows-specific than others. For example, PowerBuilder features dynamic Object Linking and Embedding, making it possible for users to invoke one Windows application within another and create hot links among the data.

Windows specificity also tends to go hand in hand with a client orientation. "PowerBuilder concentrates the processing on the client side and reserves the server for database management," says Peter Duggan, vice president of corporate information systems at The New England Mutual Life, a Boston-based insurance and information provider. New England Mutual built a system for its staff to enter insurance data into Windows PCs, which would then update the mainframe server database at headquarters. "We wanted to keep the architecture of the new application as simple as possible," he says.

On the downside, PowerBuilder applications are currently restricted to the PC. Other tools, such as Uniface Corp.'s Uniface, are cross-platform development environments that operate on non-Windows platforms as well. "Even though you may be designing an application for Windows, you spend more time with the logical layout of the data" with Uniface, says Kent Failing, president of Computer Design Professionals, a consulting firm in Atlanta.

With Uniface, applications are divided into three parts: the presentation interfaces, data definitions and the logistical handling of data once stored. The architecture lets users mix and match platforms, DBMSs, GUIs and networks, largely eliminating the need for redeveloping applications.

Of course, there's a downside to Uniface running in all environments: It really doesn't take full advantage of any one environment. "If you wish to exploit the full potential of a particular environment — in this case, Windows — you may be better off with a Windows-only tool," Failing says.

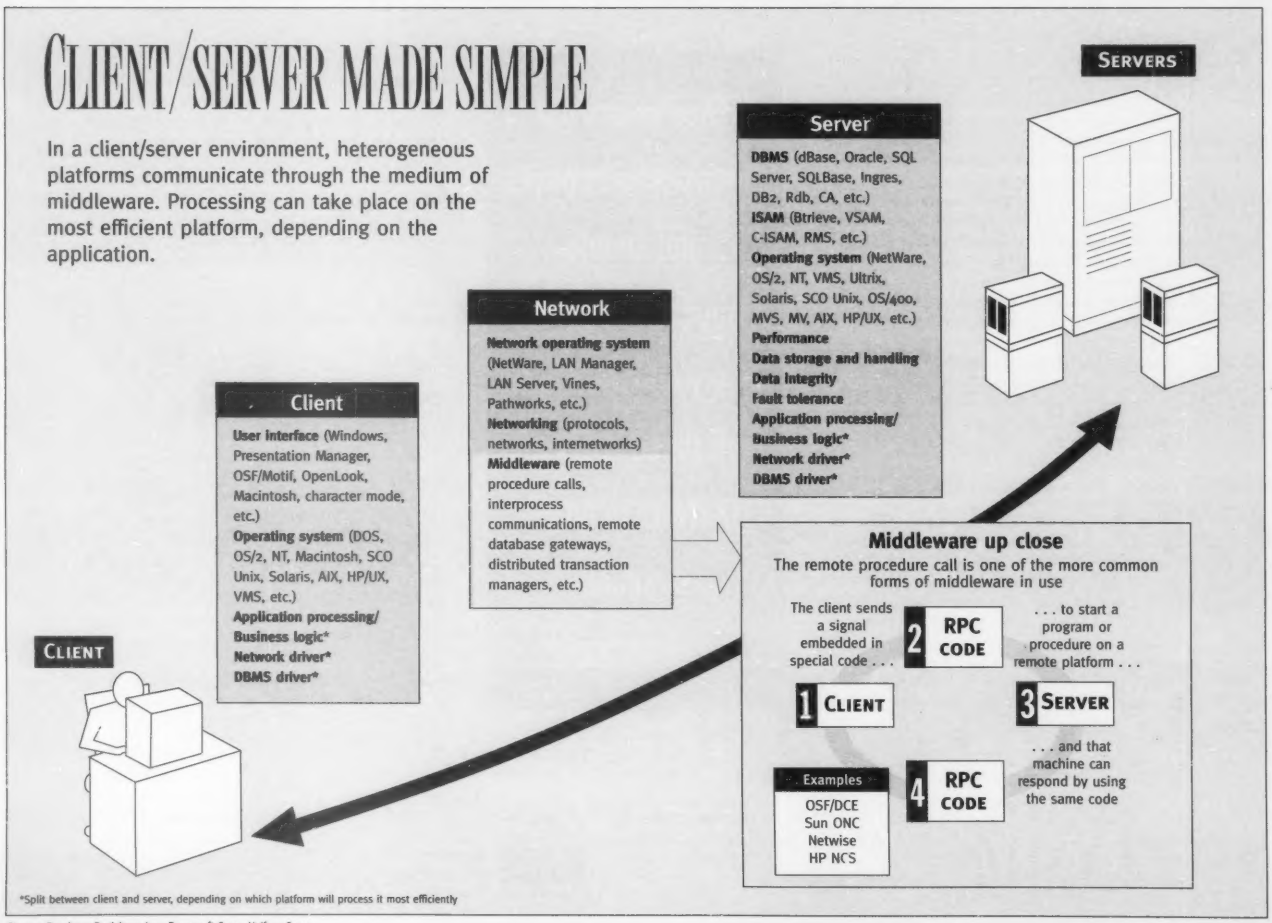
Importance of the server

Another critical difference among the various types of client/server tools is the extent to which they support SQL database processing and whether they can divide application logic among client and server machines.

Five places to code

The following are five areas in which the developer has to either write code or find a tool that generates code automatically:

1. **The GUI,** including the menus, dialogues and other interface objects.
2. **SQL statements** that are executed to insert, retrieve, delete or update information.
3. **Business rules,** which determine what the application actually does.
4. **The connections between the business rules and the GUI,** which determine the action the interface takes when an event such as a mouse click occurs.
5. **Rules for SQL** determining what is done with data once it has been retrieved, such as where and how to display it.



Source: Database Decisions, Inc., Powersoft Corp., Uniface Corp.

What about CASE?

In their favor, CASE workbenches have more extensive analysis and design modules than do most of the newer tools. Furthermore, CASE methodologies include mature project management and version control features important for creating enterprisewide applications, says Peggy Ledvina, an analyst at Meta Group, Inc. in Westport, Conn.

On the other hand, most of the Windows tools are better than CASE as smaller scale, departmental solutions.

To bridge the gap, some of the point-solution tool makers have started to partner with CASE vendors. For example, Powersoft Corp. has signed joint development deals with Popkin Software Systems, Inc. and Bachman Information Systems, Inc. to add their analysis and design modules.

Meanwhile, CASE workbench makers are peddling furiously to keep up with smaller, more easily manipulated Windows tools, says Ed Yourdon, author of several application development books.

For example, Andersen Consulting's Foundation for Cooperative Processing is frequently cited for adeptly taking up the client/server cause with its ability to generate applications for Windows, IBM's OS/2 and Unix.

For now, Ledvina advises users to "keep your CASE tools, and see what you can do to extend them down to the departmental level."

—Kim S. Nash

"Enterprise-level applications require code that is oriented to both the client and server, with more emphasis on the server," explains Judith Hurwitz, president of the Hurwitz Consulting Group in Newton, Mass. "Such development systems can be used to create applications that previously could only be developed on a mainframe, providing server-based security, data management and integrity services that cannot be handled with client-only software."

For example, with Intellicorp, Inc.'s ProKappa development environment, the server maintains primary logic operations, access to enterprise data and data modeling information. The server architecture is composed of a number of server engines that communicate, via a protocol mediated by a network manager, with client applications.

Compare that tight server link with that of PowerBuilder, which uses intelligent database objects known as DataWindows to manipulate data from an RDBMS without any need to code SQL commands in scripts.

Strong in back, weak in front

The strongest products for SQL processing are the 4GLs from database vendors such as Oracle Corp., the Ingres Products Division of The ASK Group, Inc., Information Builders, Inc. and Software AG of North America, Inc.

But these 4GLs are only now arriving at solid PC implementations. Most of them are still weak on the Windows front, even though their back-end processing is much more sophisticated than the client-only 4GLs, such as Visual Basic and PowerBuilder.

"The major database vendors are belatedly getting their acts together when it comes to Windows," Patricia Seybold Group's Rymer says. "The same is true with the 4GL vendors. They are struggling to move out of character-mode, forms-based approaches into an object orientation."

Some 4GL products that fit this description include Uniface, Ingres/Windows 4GL and SmartStar Vision from SmartStar Corp., which can dynamically query multiple, heterogeneous database tables in a single transaction. No coding is required on the part of the developer to enable these capabilities because these products include a transaction model as part of each application. They can also support referential integrity among multiple, dissimilar databases.

Achieving reusability

Taking another step forward in the ability to work in complex environments, object-oriented products provide developers with a GUI-building component, a 4GL for coding business rules and a library of commonly used application objects whose attributes can be set without programming.

"The trend in Windows tools is to encapsulate more and more of the common behavior exhibited by large numbers of applications," Shafer notes. "Programmers shouldn't have to reinvent wheels or even understand much about how they work."

Shafer sums up this philosophy with a simple guideline. "The key question when evaluating any development tool should be this: 'How little work can I get away with?' You should try to find a tool that has done as much of the hard work for you as possible." •

Baum is a free-lance technology writer in Santa Barbara, Calif., who specializes in application development issues.

DEFINITIONS

Client: A single-user workstation that provides presentation services and the appropriate computing, connectivity and database services and interfaces relevant to the business need.

Server: One or more multiuser processors with shared memory that provide computing, connectivity and database services and interfaces relevant to the business need.

Client/server computing: An environment that appropriately allocates application processing between the client and the server. The environment typically is heterogeneous, with the client and server communicating through a well-defined set of standard APIs and remote procedure calls.

*From the book *Client/server Computing* by Patrick Smith and Business Systems Group. Published by Howard Sams, a division of Prentice Hall Computer Publishing. Used by permission of the publisher.

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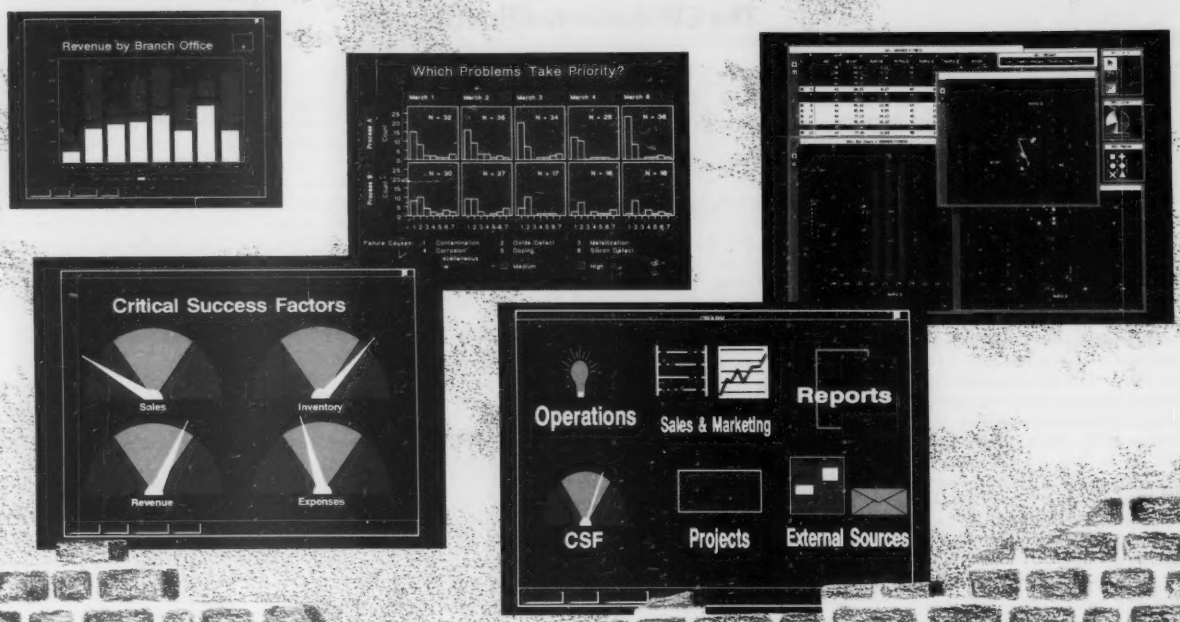

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Voice of experience

Tools have ups and downs

By Lee Ann Hantula

Like most veterans of client/server installations, I have both praise and criticism for the tools. What's kept me on track is the right attitude: Don't be seduced by sexy technology, and keep your software engineer's hat on firmly.

After several years of systems integration work on mainframes, IBM System/36s, System/38s and PCs, I began work on a custom order processing and accounts receivable system. Cost and development speed were the motivations for choosing a client/server approach, using Gupta Corp.'s SQLWindows and Oracle Corp.'s Database Manager. Here are some pointers from my experience:

It's imperative that you set up-front coding standards. SQLWindows is written in C and retains C's top-down structured flavor. But remember: Power and flexibility can be abused in any language.

For example, in SQLWindows you can broadcast a message to all objects on a window. It's like coding a "GOTO" — but to where? Without discipline and coding standards, you will end up with wildly different code among programmers.

Developers need to be intimate with back-end databases. One of the hallmarks of client/server architecture is the relative independence of front-end tools from back-end databases. But in reality, client/server developers still need to be aware of features in the back end.

For instance, your database's SQL statement optimizer may dictate that your SQL be worded in a certain way to perform well. That wording might differ for another database, so programmers need to know not only basic SQL but also specifics about your database brand.

Code debugging is much more difficult. Separating the user interface process from the database is fundamentally a good idea. But the downside becomes apparent when debugging code. To the front-end tool, your SQL code is just a string. The compiler cannot help you debug SQL or find spelling errors in the bind variables. You must use a tool along the lines of Gupta's SQLTalk and then cut and paste your SQL into your code. Then you must map the returned data into your programs' variables. It's easy to make mistakes in this process.

But the tools can be flexible and rich in features. We produced a user interface prototype within a few days that helped with user design.

And the design capabilities exceed many mainframe-based tools. The online code animator is much better than that of any large-system testing tool I've used. The source code editor is in outline form, and the outline can be expanded or collapsed. This makes writing structured code natural.

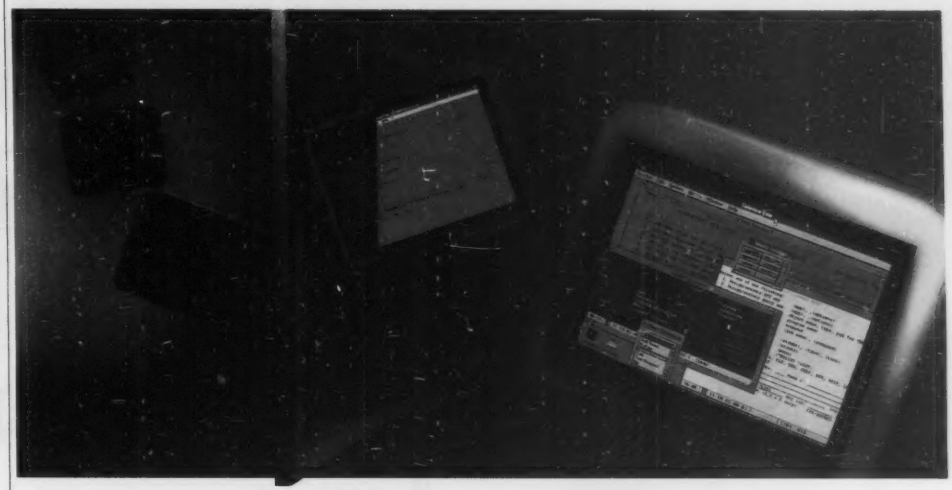
Scrolling becomes a snap. Our former mainframe users were amazed that they could scroll backward as well as forward.

Where design issues really increase is on the user interface. When do you use a push-button vs. a menu pick? Will the new bit-map icon you just designed mean something to the user or just look like a strange picture? The old issues — such as naming conventions and flexible navigation — don't go away.

And some of the tools from the mainframe arena just don't exist yet. Most large-system development platforms have well-established tool sets that help standardize and maintain code, but these aids are just emerging in the client/server arena.

Client/server technology is not for the faint of heart or those fearful of rapid change. As we look forward to future developments, we're also holding onto our software engineer hats for a wild ride. •

Hantula is a senior analyst at consulting firm Palladian Consulting Co. in Atlanta.



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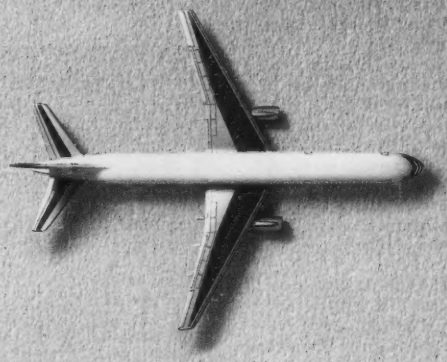

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Buyers' Scorecard: Uniface receives highest user satisfaction ratings

By Derek Slater

Although the hype is high, buyers are still cautious about jumping into client/server application development. As a result, the market for development tools is wide open.

"If you have 100 licenses out there, that makes you a major player in the client/server market," said Richard Finkelstein, president of Performance Computing, Inc.

Uniface Corp.'s tools clambered to the top in a user satisfaction poll of early market share leaders, earning a score of 76, just ahead of Easel Corp.'s Enfin/2 at 75. Powersoft Corp.'s PowerBuilder achieved a score of 72, and Gupta Corp.'s SQLWindows scored 65. JYACC, Inc.'s JAM/PI tool was not included in the final score because of a low number of respondents.

COMPUTERWORLD BUYERS' SCORECARD

Users' comments indicated that Uniface does not handle the Windows interface as cleanly as the dedicated Windows development tools. But Uniface supports other client platforms, including character mode, the Open Software Foundation's Motif, OpenLook and Workplace Shell. Support for Apple Computer, Inc. Macintoshes has been promised.

Uniface received the highest satisfaction ratings in quality of service and support and in speed.

Easel acquired Enfin Software Corp. in 1992. Users gave Enfin/2 high marks for the strength of its object-oriented programming language, based on Smalltalk. It also received the highest rating in value for the dollar.

Lower scores for Enfin/2 included service and support and speed of applications produced.

Powersoft's development tool appears to be rapidly gaining momentum in the marketplace. PowerBuilder achieved the highest ratings in ease of use and training time required but finished in the middle of the pack in most areas. PowerBuilder is a native Windows application that handles Windows interface functions well but does not facilitate porting to other client platforms.

PowerBuilder finished first in last year's client/server survey. The company just announced Version 3.0, including a version control interface and other significant enhancements.

Users said SQLWindows is relatively easy to learn and use and lets them develop applications quickly. However, it trailed the competition in quality of applications produced.

A major upgrade of SQLWindows started shipping earlier this month. It addresses some user concerns expressed in the survey, such as strength of programming language. The new version adds object-oriented features and support for collaborative programming.

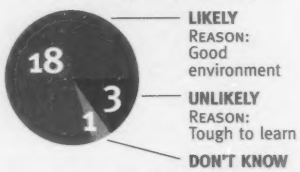
Buyers' Scorecard records users' satisfaction with their installed technologies. Users assigned 1-to-10 ratings based on their satisfaction with their tools in 17 categories. All categories were factored into the final score. The scores for each product in the six most important categories are listed in the charts. •

Uniface Corp.'s Uniface

OVERALL SCORE: 76

RATINGS ARE BASED ON A 1-TO-10 SCALE WHERE 10 IS BEST

Would you buy the product again?

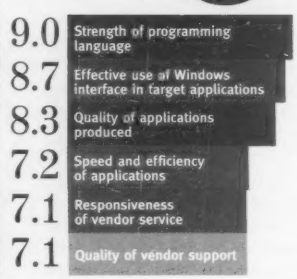


REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS

RESPONSE BASE: 22 USERS

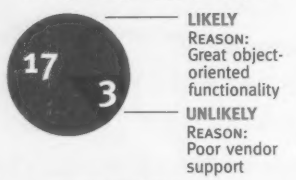
Easel Corp.'s Enfin/2

OVERALL SCORE: 75



RATINGS ARE BASED ON A 1-TO-10 SCALE WHERE 10 IS BEST

Would you buy the product again?

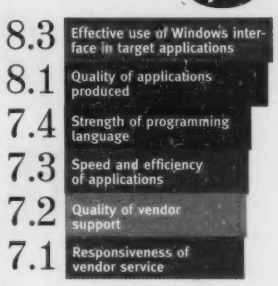


REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS

RESPONSE BASE: 20 USERS

Powersoft Corp.'s PowerBuilder

OVERALL SCORE: 72



RATINGS ARE BASED ON A 1-TO-10 SCALE WHERE 10 IS BEST

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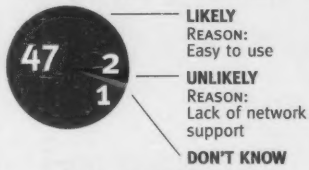
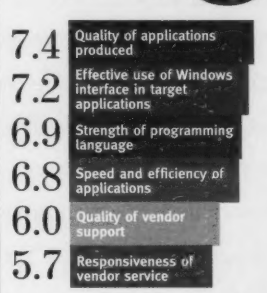


REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS

RESPONSE BASE: 50 USERS

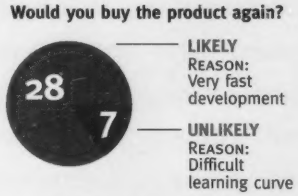
Gupta Corp.'s SQLWindows

OVERALL SCORE: 65



RATINGS ARE BASED ON A 1-TO-10 SCALE WHERE 10 IS BEST

Would you buy the product again?



REASONS ARE BASED ON THE MOST FREQUENTLY STATED ANSWERS

RESPONSE BASE: 35 USERS

METHODOLOGY

User names were obtained from a combination of vendor and non-vendor sources. First Market Research Corp. in Austin, Texas, conducted the survey and tabulated the results. The response base was 20 users for Enfin/2, 22 for Uniface, 50 for PowerBuilder and 35 for SQLWindows.

Users rated their satisfaction with their installed products and were not asked to rate one product directly against another.

The overall scores were calculated by combining each product's ratings with the importance rating given each criterion.

JYACC's JAM/PI Windows development tool was included in the survey but received an insufficient response base. Based on 11 respondents, JAM/PI scored 9.0 in quality of applications, 8.9 in strength of programming language, 8.8 in quality of support and 8.6 in speed of applications.

Computerworld thanks the following for their assistance: *Computerworld* Database Division; Richard Finkelstein, Performance Computing, Inc.

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31. Programming Management, Software Developers
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WHAT THE MARKET LOOKS LIKE

Windows client/server development tools are infiltrating from a number of directions. The market can be roughly divided as follows:

►Front-end tools

Build GUIs that can be snapped onto many types of host-based systems. Examples: Easel Corp.'s Easel, Gupta's SQLNetwork, Attachmate Corp.'s Extra.

►PC database access tools

Combine visual GUI-building capabilities with an underlying 3GL or 4GL for programming application logic and database transactions. These products typically rely on gateways to access server databases. Some can work with more than one database. Examples: Microsoft's Visual Basic, Borland's ObjectVision, KnowledgeWare's ObjectView, Gupta's SQLWindows, Powersoft's PowerBuilder, Easel's Easel Workbench, Computer Associates International, Inc.'s CA-dBFast, Open Environment Corp.'s ODE Toolkit, Uniface's Uniface.

►Object-oriented libraries

Class libraries to aid programmers with the object-oriented construction of Windows applications. Examples: Visix Software, Inc.'s Visix Galaxy, Neuron Data, Inc.'s Open Interface, XVT Software, Inc.'s Design C++, Liant Software Corp.'s C++/Views, Software Transformations, Inc.'s Universal Component System.

►3GLs for client/server

3GLs, from Basic to C++, that have acquired Windows extensions. They interface with the Windows application programming interface (API) and exhibit strong hooks to the Microsoft or Borland framework. Most are acquiring ODBC drivers, based on Microsoft's Open Database Connectivity standard. Typically weak on SQL access. Examples: Borland's C++ and Pascal for Windows, Microsoft's C 7.0 and Visual C++, CA's Realia Cobol.

►4GLs for client/server

4GLs, primarily for building relational front ends that interface with the Windows API and one or more database servers. Examples: Unisys Corp.'s Mapper, Information Builders, Inc.'s Focus, Software AG's Natural, Cognos Corp.'s Powerhouse, JYACC's JAM/PI.

►CASE tools

Information engineering tools rearchitected to deploy applications under a Windows client/server framework. Examples: Synon, Inc.'s Synon CSG, KnowledgeWare's Application Development Workbench, SEER Technologies, Inc.'s High Productivity System, Manager Software Products, Inc.'s Method-Manager, Popkin Software Systems, Inc.'s System Architect, Andersen Consulting's Foundation for Cooperative Processing. Others vendors have client/server CASE products on the horizon: Texas Instruments, Inc, Intersolv, Inc., CGI Systems, Inc., Netron, Inc.

►Knowledge-based tools

Some artificial intelligence vendors have recently released or are about to release general-purpose, object-oriented tools for client/server. These products excel at building applications that involve complex rules and logic, integrated within the Windows environment. Examples: Intellicorp, Inc.'s ProKappa PC, Inference's Enterprise Object, Trinzic's KBMS for Windows.

►Graphical query and reporting tools

Executive information system builders that use a simple spreadsheet metaphor to build reports and queries. Examples: Trinzic's Forest and Trees, DataEase International, Inc.'s DataEase Express for Windows, Pioneer Software, Inc.'s Q+E Database Editor.

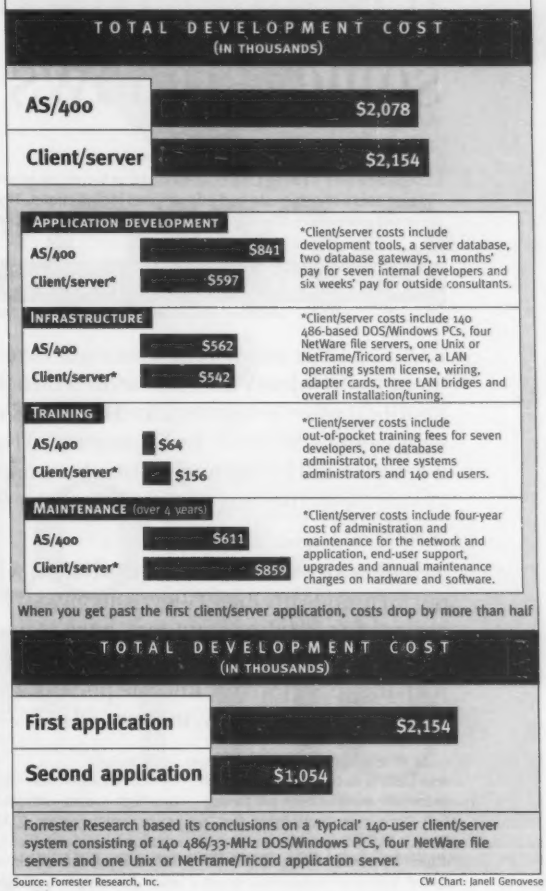
►Object-oriented visual development environments

Object-oriented tool sets that offer class libraries of prefabricated objects. These vendors see the market segmenting into object builders and object assemblers. Examples: Digitalk, Inc.'s Parts Workbench, ParcPlace Systems, Inc.'s VisualWorks, Serius Corp.'s Serius, Easel's Enfin Open Interface, TGS Systems' Prograph, Cooper & Peters, Inc.'s Window Builder.

—David Baum

WHAT USERS ARE PAYING

Two years ago, it cost 15% to 20% more to build a client/server system than a minicomputer-based system, according to Forrester Research. Today, there's a much smaller price gap.



When you get past the first client/server application, costs drop by more than half

Forrester Research based its conclusions on a 'typical' 140-user client/server system consisting of 140 486/33-MHz DOS/Windows PCs, four NetWare file servers and one Unix or NetFrame/Tricord application server.

Source: Forrester Research, Inc.

CW Chart: Janell Genovese

WHAT USERS LOOK LIKE

The typical user . . .

- . . . is creating a production application with his client/server tool set.
- . . . has one to 10 developers using the client/server tool.
- . . . is using a PC client and either a PC or a Unix server.
- . . . is accessing more than five databases with the client/server application.
- . . . plans to do data modeling with the tool.
- . . . will accomplish data modeling with a CASE tool that is NOT linked to the development tool.

Source: Based on Buyers' Scorecard survey of 138 users

ObjectView 2.0: Users find it competitive but say it lacks some Windows support features

Computerworld's Firing Line is an evaluation based on interviews with major users at corporate and educational installations. The product under evaluation is being used in live application environments.

KnowledgeWare's ObjectView 2.0

- Once a little-known client/server development tool, ObjectView has vaulted into the spotlight after being acquired by CASE vendor KnowledgeWare, Inc. Evaluators said they were pleased by the acquisition because it strengthens the long-range outlook for the product.
- Evaluators were generally satisfied with the performance of ObjectView and gave it high ratings for database support, ease of use and technical support. But they were not enamored with the report writer and the package's lack of compatibility with Windows' OLE.

As of late last year, ObjectView was hidden in the shadow of such erstwhile competitors as Powersoft Corp.'s PowerBuilder, Gupta Corp.'s SQLWindows and a host of other Microsoft Corp. Windows-based client development products that had no trouble grabbing the limelight.

That changed last month, when longtime computer-aided software engineering (CASE) tools vendor KnowledgeWare, based in Atlanta, purchased Matesys Corp. and ObjectView in a stock swap valued at more than $20 million.

While that may seem an outlandish sum for a development tool booking less than $3 million per year in sales, it does speak loudly of the growing interest in client development tools.

In addition, KnowledgeWare officials have stated that they intend to integrate ObjectView with the company's Application Development Workbench (ADW) CASE tools during the coming year. By the end of this year, ObjectView will have bidirectional links to the company's Analysis and Design Workstations (see story page 84).

For this evaluation, *Computerworld* interviewed four users of ObjectView who had been working with the tool prior to the KnowledgeWare acquisition. All had developed and deployed applications built with previous versions of ObjectView, and all had used beta-test copies of Version 2.0 to varying degrees. At the time of this evaluation — late March — ObjectView 2.0 had been in general release for little more than one week.

ObjectView is the fruit of a little-known Basic language tool originally released by Matesys in May 1990. The tool, ObjectScript, was the first Basic programming tool specifically made available for Windows 3.0. Much of that language remains today in ObjectScript, the ObjectView scripting language.

ObjectView 2.0 adds a number of new features and support options to the conventional client development tool feature list. Along with the usual array of buttons, windows and dialog boxes, the new version of ObjectView offers a spreadsheet object, business graphics, a "panel object" that can read database dictionaries and a debugger with stepping, watchpoints and trace functions.

The survey used for this evaluation was created with the assistance of Howard Rubin Associates and Technology Investment Strategies Corp.

Ease of use

ObjectView was being used by the evaluators to create applications supporting up to 300 users. With applications ranging from simple executive information systems with limited database queries and presentation screens to sophisticated transaction applications with up to 200 database tables, the evaluators were able to put ObjectView through its paces.

In all cases, ObjectView was being used by professional programming staffs. Evaluators did not recommend ObjectView as an end-user programming, querying or reporting tool.

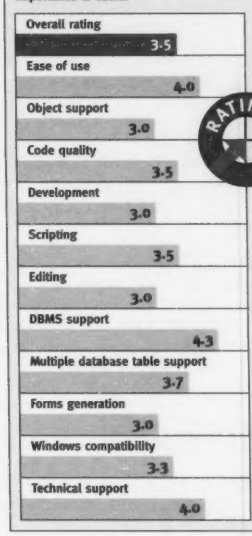
Object support

To the standard array of buttons, dialog boxes and menus, ObjectView 2.0 adds a new set of built-in objects to ease development. These include a panel object that converts a database into manipulatable ObjectView objects, a spreadsheet object with the features one might expect in any spreadsheet and a graphics object with support for bar, line, scatter and other common charts. The lat-

ObjectView, *page 84*

KnowledgeWare's ObjectView 2.0

Ratings are based on user expectations on a 1-to-5 scale, where 1 is below expectations and 5 is above expectations. Ratings are presented in order of importance to users.



Installation descriptions for users who evaluated KnowledgeWare's ObjectView 2.0

SITE PROFILES

	Systems integrator	Health care provider	Utility	Bank
Applications	Accounting, commodities trading	Decision support	Natural gas tracking, customer information	Financial, equipment tracking, call tracking
Database(s)	SQL Server	Sybase, SQL Server	Sybase, SQL Server, Oracle	SQL Server, Oracle
Network operating system	NetWare	LAN Manager, Windows for Workgroups	Unix, NetWare, LAN Manager	LAN Manager
Number of ObjectView programmers	5	3	20	70
Number of ObjectView users	50	120	200	300

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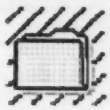

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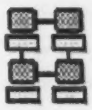

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Users are pleased with KnowledgeWare's support of ObjectView after acquiring it from Matesys

CONTINUED FROM PAGE 82

ter two objects can be used with database queries.

Evaluators were mixed in their responses to other object enhancements in Version 2.0.

Utility: "The table object makes up for some of the functions lacking in the report area."

Code quality

ObjectView includes a runtime module to execute applications on each client system. Evaluators said the execution speed of compiled ObjectView applications was on par with other tools.

Systems integrator: ObjectView applications "run faster than some applications we've seen running under PowerBuilder."

Development tools

ObjectView's new debugger with stepping and tracing was applauded by the evaluators. They had not used the new object manager in Version 2.0, but they said they thought it would be useful for multiprogrammer projects.

Health care provider: "The debugger makes it easier to see intermediate values without creating additional [testing] objects."

Editing

The ObjectView editor allows searching for parameters and functions in an application, but it lacks support for multiple source-code files. Functions can be cut and pasted into an application from the on-line Help system.

Bank: "The ability to pull in outside SQL files makes it very strong."

DBMS support

Evaluators were generally using ObjectView with SQL databases such as those from Oracle Corp. and Sybase, Inc., although Version 2.0 supports six databases, three database application programming interfaces and five database gateways.

Health care provider: "I give high marks to any product I can take out of the box and have working with Sybase."

Multitable support

Even though the largest reported application used 200 database tables and 120 screens, none of the evaluators were accessing more than a single vendor's database from a single application, although heterogeneous database access is supported within ObjectView applications.

ObjectView 2.0 features

- New object-level panel provides high-level representation of database tables.
- Interactive application debugger with code tracing, stepping and breakpoints.
- Embedded spreadsheet objects.
- Direct support for six databases, three database APIs and five database gateways.

Forms generation

Evaluators said they were generally satisfied with the forms generation capabilities of ObjectView. They said they did not anticipate developing the complex forms made possible with Version 2.0's spreadsheet or graphing objects.

Windows compatibility

Evaluators reported no significant difficulties with Windows compatibility. One evaluator did experience problems using ObjectView with a specialized, high-performance video adapter. All said they would make use of the Multiple Document Interface capabilities in Version 2.0 but were bothered that ObjectView does not support Object Linking and Embedding.

Technical support

Evaluators had built strong relationships with the support staff at Matesys prior to its acquisition by KnowledgeWare and were concerned that the acquisition would affect the quality of technical support. However, their limited experience with KnowledgeWare's technical support has been positive so far.

Systems integrator: "Whenever we called, we got more than we expected. Since the KnowledgeWare acquisition, it's better."

Written and compiled by senior editor Garry Ray.

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KnowledgeWare responds

Donald Addington, KnowledgeWare's president and chief operating officer, answered questions about some of the issues raised in this evaluation:

Q: What are KnowledgeWare's plans, if any, to integrate ObjectView with the KnowledgeWare Encyclopedia?

A: Integration of ADW and ObjectView is one of our highest development priorities. Integration will be delivered in two phases — Phase I (available in June) allows developers to import objects and functions from the ADW/Design Workstation. Phase II (available later in 1993) links ObjectView to both the Analysis and the Design Workstations and allows bidirectional access to design objects.

Q: How does KnowledgeWare intend to support version control and configuration management in multiple programmer shops using ObjectView?

A: Version 3.0 (available in mid-1993) features an object repository allowing developers to share and reuse common objects, with underlying code, throughout their applications. Multiple forms of inheritance are supported at the object level. Version 3.0 will also provide check in, check out and version control.

Q: How will the acquisition of ObjectView alter the technical support policies instituted by Matesys?

A: They are significantly enhanced. ObjectView users now have access to KnowledgeWare's customer support organization, which is orders of magnitude more robust than Matesys was able to provide as a small start-up. We have preserved the variety of service plans customary for tools such as ObjectView. Customers can choose among maintenance service (fixes, minor enhancements), upgrade services (maintenance plus major enhancements), hot-line telephone support and TopView service (a combination of all services targeted at the ObjectView developer).

Q: What is KnowledgeWare's thinking on the general utility of point-solution client/server tools? How does this fit with the company's efforts in the upper-CASE area?

A: KnowledgeWare still believes in the fundamental importance of building systems and applications based on solid requirements. The current generation of point tools identifies requirements through iterative prototyping, CASE tools through a rigorous analysis and design process. We see a convergence of these approaches to yield powerful, easy-to-use tools for development of increasingly complex client/server applications and systems. Fundamental to this convergence is the expanded use of object-oriented techniques as a cornerstone of the development process. The next wave of development technology will have object orientation as its basis.

Q: Why did KnowledgeWare buy Matesys and ObjectView?

A: Our customers want visual development tools for rapid development of client/server applications, and they want the benefits of object-oriented development. ObjectView was architected to take advantage of object-oriented development techniques. We want to continue to be the No. 1 provider of application development tools and services, so we have to offer the kinds of products that have value to our customers today. We expect to continue to expand our product and service portfolio as the infrastructure for client/server applications matures over the next few years.

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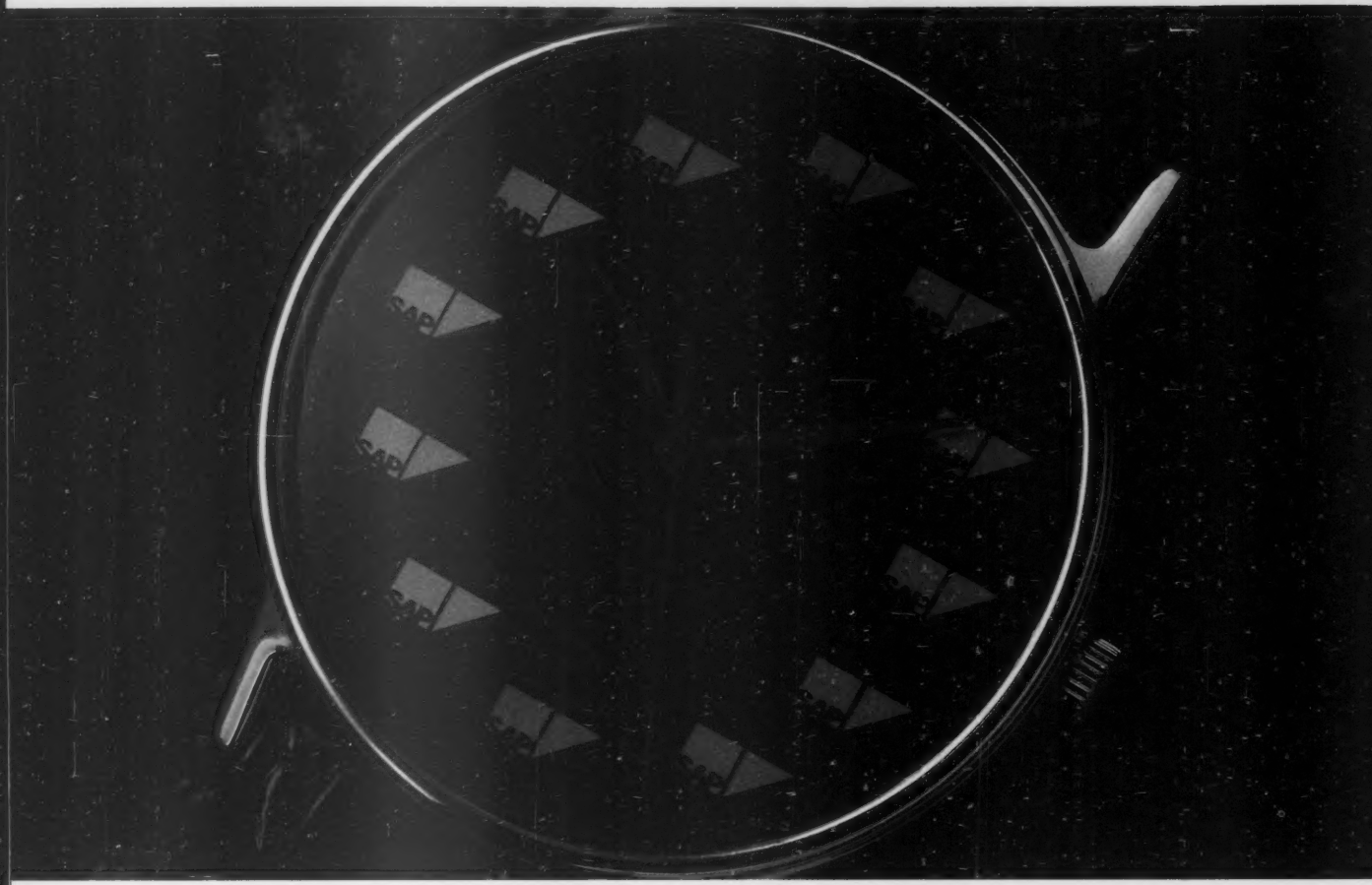

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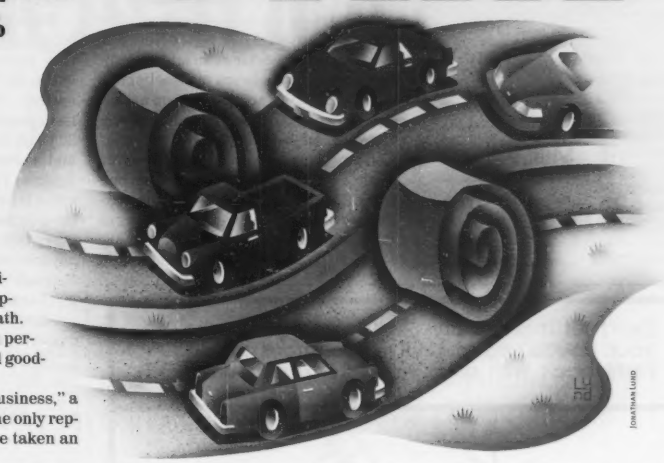
NETWORK JAM

Client/server activities such as database updates can overburden your network — but not if you make sure it can expand by at least 30%



By James A. Hepler

Nothing can drain the lifeblood out of a client/server system faster than an inadequate network.

For one furniture manufacturer, whose client/server architecture supports its high-volume, rapid response shipping operation, slow data traffic nearly choked its operation to death. The numbers were startling: In six months of poor network performance, the company lost nearly $2 million in business and goodwill and at least $700,000 in employee productivity.

"Network problems were ruining our reputation and our business," a senior business manager explains. The company's was not the only reputation in peril: The information systems manager has since taken an "early retirement."

What happened to this firm isn't unusual in client/server setups. IS staffs generally spend more time and money worrying about raw connectivity and how to migrate than about whether the network will be robust enough and fast enough to handle what client/server throws at it. The result: The network can be the Achilles' heel of a client/server effort.

But it doesn't have to be if you put enough bandwidth behind your efforts. Client/server architectures strain networks for several reasons: Their distributed nature increases the network load, security and backup demands can be hefty and physical layout can slow things down as data meanders through bridges, routers and gateways.

Network killers

SOME CLIENT/SERVER ACTIVITIES PUT A HEAVY STRAIN ON YOUR NETWORK

CLIENT/SERVER ACTIVITY	NET EFFECT
Two-phase commit and distributed network functions	Up network traffic 5% to 40%
Security checking	Hikes transaction volume 2% to 5%
Distributed physical layout (hodgepodge of software, hardware and connectivity devices)	Increases network overhead 10%; creates five- to 10-sec. delays

Because client/server is a distributed technology, much more dialogue occurs between clients and servers than among machines in "traditional" terminal data access.

For instance, in an order processing and fulfillment operation, there is information flow between client and servers, as the client queries every server-resident database for information to fill an order. Important to this exchange is the two-phase commit, which synchronizes and updates databases on both ends of a transaction. A shipping order, for example, is guaranteed on both the sending and the receiving ends.

While two-phase commit is critical to database accuracy, it adds significant traffic to the system. With each update, numerous messages cross the network among nodes. Network traffic can rise from 5% to as much as 40% for systems with a complex distributed database.

For example, after the furniture manufacturer put its client/server system in place, it saw network response time for order processing climb from subseconds to 15 seconds and longer. Creating a pick list went from two to 30 minutes. This sluggishness was in part because of two-phase commit activity, which upped data volume on the network.

As business grew, so did overtime to complete a day's orders. Some employees, tired of waiting for the pick list to navigate the network, began shipping partial and incorrect orders. Same-day shipping with 99% accurate delivery in one or two days became delivery in a week, with questionable accuracy.

Network Jam, *page 90*

Network jam

CONTINUED FROM PAGE 89

The result was a dramatic increase in customer complaints and returned or canceled orders. Expenses related to incorrect shipments increased more than 600% in a six-month period.

The firm had two choices: add a second shift of eight workers — at $400,000 a year — or pump up the network bandwidth. Boosting bandwidth by 40% was the economical choice. Immediate network improvements cost $180,000, with another $100,000 budgeted for the future. The company upgraded the server, at a price of $75,000, to bring it up to speed with the more robust network.

Sufficient bandwidth is also important for handling peak loads that two-phase commit activities can create. For example, if the network goes down, clients can continue to work on a distributed database, but the system might not be able to post information to the server database. When the network comes back up, it's like a dam breaking: Updates flow all at once to all databases, temporarily worsening network performance.

Security checking between client and server can also slow transaction time and increase network traffic. Clients and servers must talk to each other not only to ensure authorized users are on the network but also to find out whether the physical client machine is legitimate and not a hacker attached to the network. Such security checking can add 2% to 5% to the volume of network transactions.

Even activities such as backup and recovery can be a burden on a client/server network. Depending on the frequency and times a company backs up a client to a server, large bursts of data hit the network. That's not a problem until production work passes through the network at the same time backup and recovery are happening. The result is a reduction in network bandwidth and a delay in getting production data to its destination.

After it moved from a mainframe-based to a client/server architecture, one cement manufacturer found that the only sensible way it could back up critical data was to reduce network operating time.

While bridges and other connectivity tools helped ease network operation for this cement manufacturer, they can cause problems when part of a legacy system. Data center-based networks have grown and evolved during the last 20 years into a hodgepodge of hardware and software, including a variety of bridges, routers and protocol converters. It is likely that a major company may have 50,000 users tied together through every type of network imaginable, from asynchronous dial-up to IBM Systems Network Architecture to Token Ring to local-area network connections.

When you pit client/server's increased data traffic against the challenging physical layout of these "evolved networks," the result is not pretty.

Passing through protocol converters or system software, such as VTAM, to make physical connection to a database server can cause network delays. These delays not only affect the client/server application but can also affect other networks through which data passes. Certain physical configurations can increase network overhead by 10%, creating delays of five to 10 seconds.

The more clients and the more disparate their locations, the more complex this process becomes.

Plan with purpose

Underestimating the amount of traffic in a client/server network isn't unusual in these early days of the technology. Traditional network planners aren't familiar with this environment and overlook the toll extra transactions such as security and two-phase commit can take on the network. These network planners are used to asking, "How many orders do you transmit per hour?" or "How much data is in an order?" What they are not used to asking is, "How many servers need updating?"

Companies need to build a network that can grow with their client/server aspirations, one that is adequate and expandable enough so they only have to do minor alterations over two or three years. One rule of thumb is to implement a network that can grow at least 30% before it gets saturated.

A major manufacturing company found out the hard way that it didn't have enough network to handle client/server. While the company could add departments to the $1.2 million backbone as they came on-line, the increased traffic pushed the backbone to its limits. Fourteen months after it bought the network, the company had to rip it out and replace it at a cost of $1.6 million. Savvy planning could have saved the company some money; it had the option initially to purchase an expandable backbone at an incremental cost of $300,000.

If your network can handle a peak amount of data with minimal delay at times of heaviest production use, it is at least in the bandwidth ballpark for client/server. •

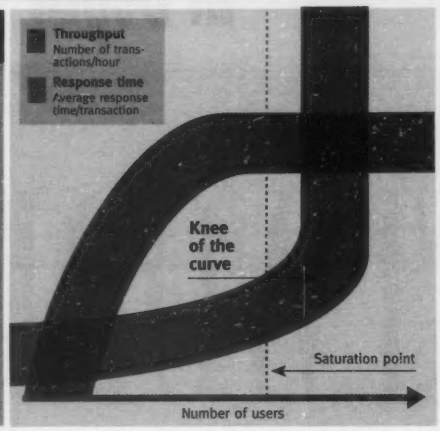
Hepler is a Detroit-based senior technical consultant at Hewlett-Packard Co.'s mainframe alternative practice, which is part of the company's Professional Services Organization.

Enough is enough

Good client/server network planning includes knowing when a network will hit its "knee of the curve," – that is, its saturation point.

As users and transactions increase on a network, response time degrades. Data collisions and other networking delays become more likely.

The slowing of response time is gradual and hardly noticeable until you reach the "knee," when response time soars suddenly and dramatically.



Source: James A. Hepler

Money matters

AVERAGE COSTS (INCLUDING SUPPORT STAFF) FOR AN ADEQUATE NETWORK TO HANDLE CLIENT/SERVER VARY, DEPENDING ON COMPANY SIZE

SMALL COMPANY	$50,000 per year
MEDIUM COMPANY	$400,000 per year
LARGE COMPANY	$20 million per year

Source: James A. Hepler

Mind meld

TO DETERMINE IF YOUR NETWORK IS ADEQUATE FOR CLIENT/SERVER, ASK YOURSELF THE FOLLOWING QUESTIONS:

1. Does our existing network have the bandwidth and speed to handle the anticipated traffic?
2. Are security, backup and recovery adequate for the types of files and transactions?
3. Can we expand the network conveniently and economically?

Breaking point

The point at which an IS manager will say with conviction, "The response time on my network is unacceptable" is difficult to predict. He may be willing to endure slower response time to save some money.

One IS manager at a market research firm was willing to go from a two-second response time with his traditional system to a five-second average response with client/server because of the savings. The client/server system's network and systems were 10 times cheaper than what he was using previously, saving the firm $3 million a year.

For mission-critical transactions, however, IS may put a priority on fast response times.

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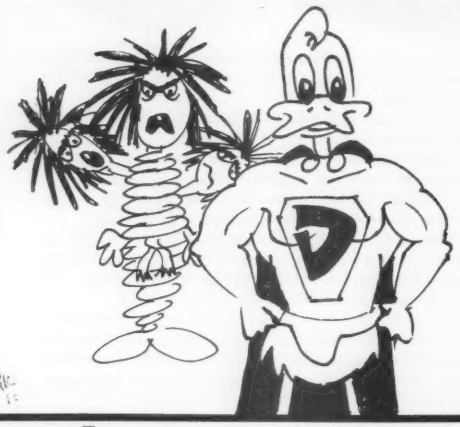

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Self-assessment strategy

Look at the present to plan for the future

By Naomi Karten

COMBINE THE QUICKENING pace of business and technological change with increasing pressure to cut information systems costs, and wise IS personnel will realize that it's up to them to plan for their career futures.

Developing an action plan for your career requires a willingness to do a little analysis and self-assessment. Once you've done that, it's time to put your career plan in writing and establish a time frame for a periodic reassessment of your progress.

Take a minute to jot down your professional goals, both immediate and over a five-year period. Take a look at how your goals may have changed in the past several years or even since you took your current job. Sometimes, careers take an unplanned twist — an outsourced IS department, for example.

Once you've established a career time line, check your progress against it periodically. If, for example, you want to move from a technical position to a more management-oriented job, your goals should reflect incremental steps to achieve that end.

Your company

With the big picture in focus, it's time to start by answering some commonsense questions; putting them on paper can add perspective.

■First, are you familiar with the education and job options your company offers for professional development? Many companies offer numerous options for career advancement, both in technical and management positions. For example, a stint in a user department could broaden your perspective on the problems IS is called on to solve.

■What two key areas do you want to improve? These could range from a broadened understanding of your business to developing expertise in client/server architecture.

■Do you keep current with changes in the IS world? Do you routinely question the implications of these changes relative to your own advancement?

■What other skills must you work on to advance in your IS career? Many IS positions require competence in listening, negotiating, managing conflicts, influencing and gaining concensus.

■In your current post, what options are available to you to gain skills needed to move ahead?

■What specific steps will you take in the next 12 months to acquire these skills and experiences? How will you measure your success?

■Pinpoint the people who can help you gain a perspective on your current status and your options for the future.

Where are you now?

So now you know where you want to be in five years and whether your current company can get you there. What about your current job?

Here are some issues you should consider.

■How would you describe your current position? This should be done strictly in terms of the work you actually do. Why? Many people have a title such as programmer/analyst, not because it describes their work but because their company has not yet come up with a title that better suits their responsibilities.

■What aspects of your job do you particularly like or dislike? Consider specific tasks, such as database design or performance reviews, as well as general responsibilities, such as managing a development team or providing PC support.

■What technical, analytical, interpersonal and management skills does your position require? Which of these skills is most valuable for the next position you'd like to have? What skills would you like to develop or use that are outside your current position? Why are they outside your current scope?

■Lastly, think about your office environment. For example, do priorities change constantly? Is management receptive to risk-taking?

Technology track

If you want to stay technologically current, you have to do the homework. First, assess how up-to-date your company is technologically. How much interest does IS have in leading-edge technologies such as client/server, object-oriented design, network management, workgroup computing and desktop operating systems (e.g., IBM's OS/2 and Microsoft Corp.'s Windows NT)?

■What new technologies does your organization view as integral to its ability to successfully respond to corporate goals and responsibilities?

■What has been the impact of these technological changes on your IS organization and your current position? What about the future? For example, if you're a Cobol programmer in a company moving to client/server, it's time to learn new skills.

■What is your level of expertise in using, supporting or managing emerging technologies? What steps have you taken to become conversant with technological changes?

■What has been the impact of the growth in end-user computing in your company on the division of computing responsibilities between users and IS?

■What is your reaction to the technological changes now taking place?

Once you've determined your goals, it's up to you to take action to make them happen. This could mean talking to your manager about taking on more responsibility. Or it may be time to look outside your company.

You might also use this checklist as a way to identify new technologies you'd like to learn more about, as well as a way to measure where you are against where you want to be.

Karten is president of Karten Associates in Randolph, Mass., and author of *Managing expectation: Dealing with people who want more, better, sooner, faster, now!* Her MCI Mail address is NKARTEN.

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Career advice for the '90s

International jobs worth a look

Fast Track is a twice-monthly column dedicated to answering questions on career directions. This week's guest is Steven B. Fogle, a managing director at the Alexander Group, an executive search firm with offices in San Francisco and Houston.

Q. I have a computer science degree with eight years' experience. Because of a recent financial hardship, I need to increase my income substantially.

I've been thinking of looking in Saudi Arabia. What opportunities are available there? What other options might I consider?

A. An international position can be financially lucrative if you are willing to make that type of personal sacrifice. Depending on how much you need to increase your income, you may also want to consider a sales position using your technical background or become a consultant, which requires significant travel. Both positions can pay much more than most information systems jobs.

You can also work as a contract IS employee on long-term projects that pay much more than full-time, in-house positions.

Q. I received my associate's degree in computer science and plan to obtain a bachelor's degree this summer. I've been looking for a job, but everyone wants at least two years' experience and/or a bachelor's degree. How can I find an entry-level programming position?

A. Try to find a job using your administrative skills in an IS department. While in this type of position, you can learn about programming positions and how you can direct your skills after finishing school.

Large companies might support your movement into a programming position while you continue your education. Smaller firms may let you wear several hats and assume some programming responsibilities.

Q. I have been the IS manager at a medium-size company for four years. I have 18 years of IS experience. Economic conditions prompt me to explore the market.

Unfortunately, when I speak to IS recruiters, they tend to look only for similar positions and not for the "move up" that I am looking for. Is there a different type of recruiter that specializes in high-level posts?

A. The best way to find these jobs is to create opportunities yourself. Identify companies where you would like to work and make contacts with senior IS management at each one.

Contact the major retained general management search firms. These can be found in the Directory of Executive Recruiters, and such firms specialize in recruiting professionals for senior IS management positions.

Q. I have 12+ years' experience in data processing. For the past two years, I've worked at a software vendor. I spend most of my time at client sites coding Natural and Construct and teaching my company's software products. But by not being in the office, it's hard to keep up with technologies. How can I keep up to date?

A. It appears that your interest lies in software development. You might pursue this in a company where you can use your computer-aided software engineering experience.

You may also have to make a career change into a systems shop where you can learn design processes and work with a development team.

VOICE OF EXPERIENCE

If you have a career question you've always wanted to ask your boss but haven't had the courage, Raymond Perry has your answer. The chief information officer at Avon Products, Inc. will be our Fast Track guest adviser in the May 24 issue. If you'd like him to answer your career question, fax it to Kelly Sewell by May 5 at (508) 875-8931 or call our Fast Track line at (800) 343-6474, ext. 522.

How to propose an unsolicited development project

TIPS for the TIMES

■ Regardless of who you present it to, you really need to find a champion for the idea — someone in the user community or the IS department who will go to bat for you. That's key to getting any of these applications projects acknowledged.

Greg Klein, MIS manager
Sara Lee Personal Products Trading Division, Winston-Salem, N.C.

■ I would approach my boss directly after I had evaluated what the project would require. We're understaffed, so we would have to determine how to spread our resources. Then, my boss and I would take a fairly well-developed proposal to the user department head.

Jerry Weinberger, senior systems analyst
New York City Department of Transportation, New York

■ In my company we have a program specifically for that process called "Kaizen," a Japanese word that means continuous improvement. We have a facility for initiating ideas so that we get credit for them and so they are evaluated by management. I've had several ideas accepted for new, small applications.

Andrew Blakeslee, programmer/analyst
Carnett, Jacksonville, Fla.

■ Approach the user first and propose the application from his perspective. Design it the way you think he would think it should operate, even though he didn't come up with the idea originally.

Joe Backs, programmer
The Bowlin Co., Shreveport, La.

Compiled by Leslie Goff, a free-lance writer in New York.

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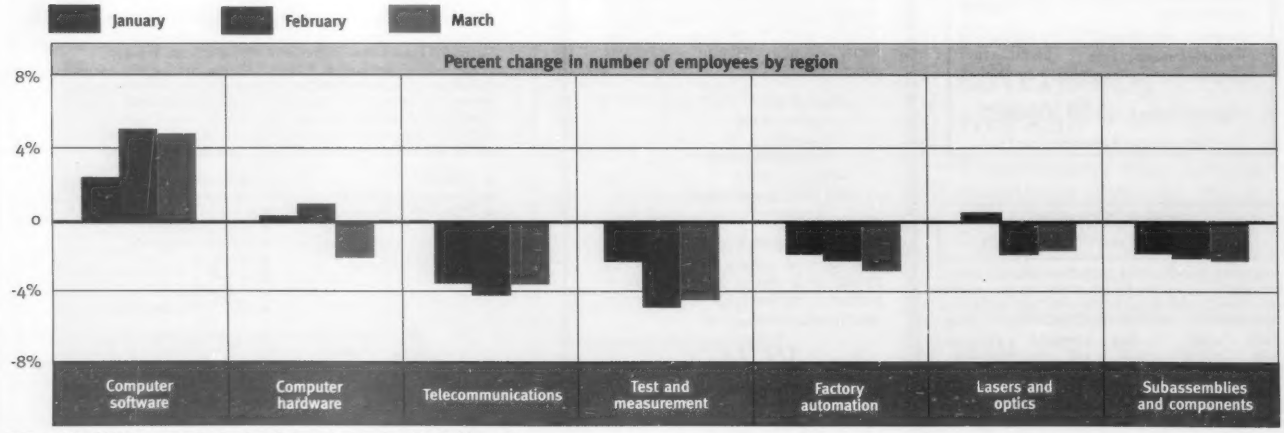
Computerworld/CorpTech Career Index

The computer software industry steadily hires while other industries continue to cut back



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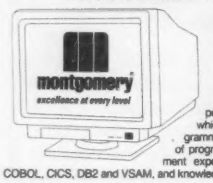

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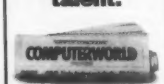

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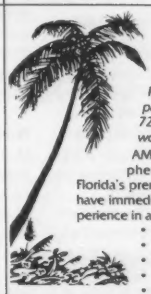

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When your PC vendor goes belly-up

shopper alert!

By Alice Bredin

Should you worry when your PC vendor disappears? Only a little, say information systems veterans. Companies contacted for this article fared well when faced with this dilemma by planning ahead and not panicking. Here's how they did it:

A few months ago Harvard University lost its key PC provider. Tandon Corp. filed for Chapter 11 bankruptcy protection, leaving the university with approximately $80,000 worth of Tandon computers and PCs. For Harvard, this meant no more warranties, no more technical assistance and no more spare parts.

However, the lost warranties and technical support did not worry Harvard's IS staff — they could handle most PC repairs. The real problem was getting parts for the machines. "Essentially, we are facing using generic parts to the extent that they are available," says Dick Sullivan, manager of technical services.

Harvard also plans to contact the company that bought out Tandon's stock, as well as other sources, to continue the flow of spare parts. "We are cannibalizing the machines we have in stock to keep machines in use going," Sullivan says.

Under the circumstances, Harvard's IS staff, like the staffs at many firms, is coping well with a PC vendor that's gone belly-up.

One reason for this success is that more firms are maintaining their own PCs to begin with. According to a Dataquest, Inc. survey, 50% of all Fortune 1,000 firms handle traditional PC service and support in-house, and another 27% use both in-house and outside services.

Companies that receive service from third parties can usually expect their agreements to be honored even if the vendor shuts itself down.

Even if you don't have in-house support now, it can be brought in easily by purchasing service manuals and tools from the defunct vendor, says Stephen Clancy, associate director of desktop support services at Dataquest.

No one home

One company forced to bring service in-house was Roland R & D Chicago, Inc., a research and development subsidiary of a musical instrument manufacturer. When staff technicians called QIC, they discovered that their PC vendor's phone had been disconnected. At first, Everex Systems, Inc. supported the PCs because it had manufactured QIC's systems, but it stopped service less than a year later. "We've fixed things ourselves because a lot of us have had similar problems," says Loch Milaw, project engineer at Roland R & D.

The real hassle for most companies is obtaining parts and upgrades. "I don't know of any parts you can't get some way, but it may cause you a lot of headaches," says Dennis Smeltzer, editor of *Service and Support Management*, a magazine devoted to service and support professionals in Overland Park, Kan.

HOW THE PROS COPE

Why do companies succeed?

- They service their own PCs: 50% of Fortune 1,000 companies handle traditional service in-house.
- They bring service in-house by purchasing service manuals and tools from the defunct company.
- They regularly stock parts based on the life of the product.
- They move critical applications off equipment from defunct vendors when parts become too expensive or difficult to find.

The biggest hassles?

- Finding parts and upgrades.
- Third- and fourth-party vendors' markups on defunct equipment.

For starters:

- Call the vendor's strategic service partners (generally third-party service providers) to see if the company is still providing service.
- Call the vendor's trustee to locate laid-off service technicians who may continue to service your machines.

In addition, third- and fourth-party vendor markups on defunct equipment may be prohibitive.

For some companies, scavenging parts is a way of life. Brad Elliott at Amoco Production Co., for instance, has seen his PC vendors disappear so many times, he knows what to do before it happens.

As the supervisor of field computing technology support at the Houston-based oil and natural gas exploration and production division of Amoco Corp., Elliott regularly stockpiles parts based on the life of a product, such as clone motherboards that will fit in all his PCs. He also purchases PCs and scraps them for parts even when a vendor looks financially healthy. If certain parts are too difficult or expensive to find, Elliott moves the work load to another system.

Other IS veterans move PCs from defunct vendors out of mission-critical areas even before they look for suppliers. "We don't want machines with a questionable parts supply to be used as servers," Sullivan says.

Action plan

If your PC vendor goes under, the first step is to follow up with the vendor's strategic service partner, generally a third-party service provider, to see if maintenance is still being provided. If it's not, firms should call the vendor's trustee to locate the laid-off service technicians, who may be working on their own or at a new firm.

Overall, IS staffs who have faced this experience say there isn't necessarily that much difference between when a PC manufacturer is in business and when it's not. "Just because a company went out of business doesn't mean it has an inferior product," says Charles Thompson, general manager of the Boston Computer Exchange Corp., which buys and sells brand-name used computers. "A lot of companies still in business wouldn't be able to get you parts for a four- or five-year-old machine anyway."

Bredin is a free-lance writer based in New York.

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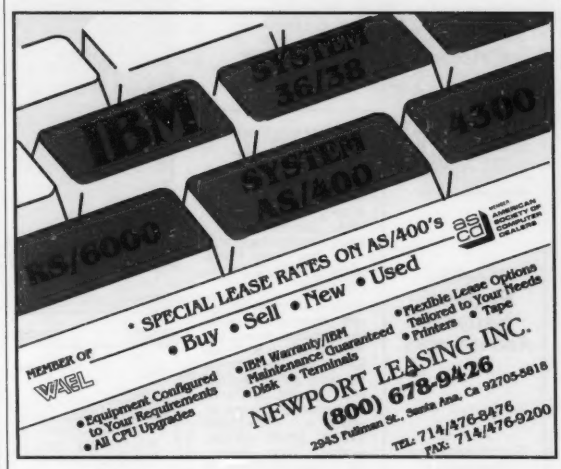

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showcase your ad by product category!

Whether it's used equipment, software, time, services or just about any other category of computer product or service, *Computerworld's Product Classified Pages* are organized to make your ad visible and to make buying your product easy.

Just look!
Computerworld's Product Classified Pages Product Categories

software
hardware
conversions
time/services
buy/sell/lease
communications
training/education
bids/proposals/real estate
graphics/desktop publishing
peripherals/supplies
business opportunities
solutions directory
used equipment listings

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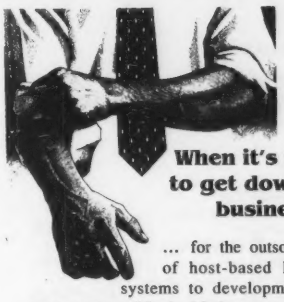

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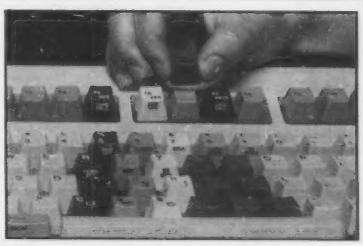

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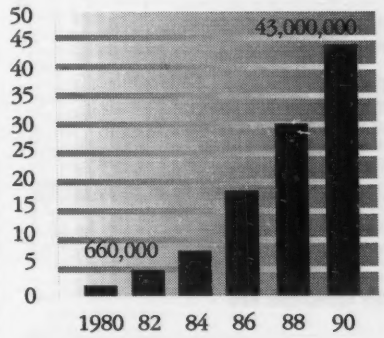

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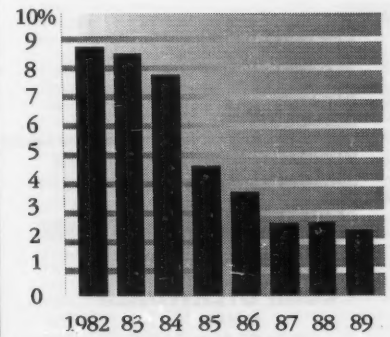

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- a few examples from our survey-

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MVS	operating system	257,248
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Sources: *International Data Corporation **American Council on Education

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Advanced Micro Devices (H)	30.5
Group I Software	23.8
IMRS	23.2
Intelligent Info. Systems	22.1
MathSoft	21.9
Picturetel Corp.	20.3
Rasterops	18.9

Dollar

Advanced Micro Devices (H)	7.25
Silicon Graphics	4.38
Intelligent Info. Systems	4.25
Informix Corp.	3.88
EMC Corp.	3.75
Picturetel Corp.	3.25
Adobe Systems Inc.	3.00
IMRS	2.88

Losers

Percent

Sierra Semiconductor	-36.3
Bachman Info. Systems (L)	-25.0
Cambex Corp.	-19.4
Easel Corp.	-18.8
American Mgmt. Systems	-17.3
Ask Computer Systems	-17.0
Intel Corp.	-16.0
Rexon Inc.	-16.0

Dollar

Intel Corp.	-17.75
Cabletron Systems (H)	-5.25
Microsoft Corp.	-5.25
Powersoft	-4.50
Sierra Semiconductor	-4.13
American Mgmt. Systems	-4.00
AT&T (H)	-3.38
Dell Computer Corp.	-3.38

Cold storage

The PC disk drive industry suffered through a "self-destructive" first quarter this year, according to Salomon Brothers, Inc. analysts John Dean and Kristienne Perry.

A surprising price war kicked in to put pressure on drive manufacturers' revenue and gross margins, Dean and Perry said in an April 15 report.

Technology difficulties in moving to new drives forced **Conner Peripherals, Inc.** (CNR) and **Maxtor Corp.** (MXTR) to derive more revenue from sales of older models with lower capacity and lower profit margins. An oversupply of high-capacity models ultimately resulted in putting heavy price pressure on models of all sizes. Manufacturers were forced to drop high-end model pricing to compete on a cost-per-megabyte basis with the older drives.

For example, Salomon Brothers estimated that prices of 340M-byte disk drives dropped nearly 21% in the first quarter. Overall, it estimated that prices declined 15% in the first quarter for disk drives with capacities of 340M bytes or less, coming on top of a 9% drop in the fourth quarter of 1992.

Drive suppliers' stocks tend to rise or fall as a group, Dean and Perry noted. The shares typically rise only when investors are confident that the companies will be able to sustain gross margins of 20% or higher. Salomon Brothers said it expects the composite margin for the group to stay below that level until the fourth quarter of this year, although investor anticipation could push the stocks up somewhat earlier.

For now, Salomon Brothers is advising investors to stand pat on most of the drive companies' stocks.

—Derek Slater

Salomon on disk drives

RATINGS FROM SALOMON BROTHERS FOR DISK DRIVE MANUFACTURERS

Company	Share price 4/21	Recommendation
Conner Peripherals, Inc.	13 1/8	Buy
Maxtor Corp.	7 7/8	Hold
Micropolis Corp.	6 1/2	Hold
Quantum Corp.	13 1/8	Hold
Seagate Technology, Inc.	15 5/8	Buy
Western Digital Corp.	5	Hold

Sources: Salomon Brothers, Inc.

Exch	52-Week High	52-Week Low		April 23 3 PM	Wk Net Change	Wk Pct Change
COMMUNICATIONS AND NETWORK SERVICES					Off 0.9%	
OTC	36.75	9.63	3 COM Corp.	30.88	0.00	0.0
NYS	80.25	61.38	American Info Techs Corp. (H)	77.13	-2.13	-2.7
NYS	60.38	40.63	AT&T (H)	56.50	-3.38	-5.6
OTC	3.56	0.75	Artel Communication Corp.	2.19	-0.13	-5.4
OTC	24.50	10.25	Banyan Systems Inc.	17.00	0.25	1.5
NYS	56.75	42.38	Bell Atlantic Corp.	52.88	-1.75	-3.2
NYS	57.50	46.75	Bellsouth Corp.	53.88	-2.88	-5.1
NYS	6.25	3.63	Bolt, Beranek & Newman	4.63	-0.50	-9.8
OTC	18.50	9.75	Brooktrout Technology	10.75	-0.75	-6.5
NYS	93.00	42.13	Cabletron Systems (H)	83.88	-5.25	-5.9
OTC	34.75	17.75	Chipcom Corp. (H)	29.75	-2.75	-8.5
OTC	48.25	16.50	Cisco Systems Inc.	42.50	-2.00	-4.5
OTC	20.50	5.50	Compression Labs Inc.	10.00	0.88	9.6
OTC	4.63	0.88	Data Switch Corp.	3.44	-0.50	-12.7
NYS	22.13	13.00	Digital Comm. Assoc. (L)	13.38	-0.38	-2.7
OTC	12.75	6.00	Digital Systems Int'l Inc.	6.25	0.25	4.2
OTC	31.63	4.00	DSC Communications (H)	31.63	1.75	5.9
OTC	9.50	4.75	Fibronix Int'l Inc.	6.75	0.00	0.0
OTC	28.50	8.75	Filenet Corp.	11.00	0.75	7.3
OTC	4.38	1.50	Gandalf Technologies Inc.	2.94	-0.06	-2.1
OTC	2.06	0.69	Gateway Communications	1.06	-0.06	-5.5
NYS	11.50	2.88	General Datacomm Inds.	9.50	0.38	4.1
ASE	4.13	2.00	Go Video	2.31	0.00	0.0
NYS	37.75	30.63	GTE Corp.	34.88	-1.13	-3.1
NYS	84.25	62.50	ITT Corp. (H)	80.50	-2.75	-3.3
OTC	49.25	29.88	MCI Commmunications Corp.	48.00	1.00	2.1
OTC	12.00	2.25	Microcom Inc.	3.50	-0.25	-6.7
OTC	24.25	4.75	Netrix Corp.	5.50	-0.50	-8.3
OTC	19.00	8.75	Network Computing Devices (L)	10.50	1.50	16.7
NYS	15.38	5.38	Network Equipment Tech. (L)	6.50	0.75	13.0
OTC	23.25	8.00	Network General	10.25	-0.50	-4.7
OTC	15.75	8.50	Network Systems Corp.	9.75	0.63	6.8
OTC	64.00	13.63	Newbridge Networks Corp.	60.00	0.75	1.3
NYS	46.00	30.50	Northern Telecom Ltd.	34.50	-0.25	-0.7
OTC	35.25	22.50	Novell Inc.	31.25	-0.63	-2.0
NYS	92.50	74.63	Nynex Corp.	86.50	-3.38	-3.8
OTC	30.00	14.50	Octel Communications Corp.	21.25	0.63	3.0
OTC	6.75	3.38	Penril Data Comm Networks	4.25	0.00	0.0
OTC	40.50	10.25	Picturetel Corp.	19.25	3.25	20.3
OTC	15.25	5.25	Proteon Inc. (L)	5.88	0.13	2.2
NYS	30.38	10.16	Scientific Atlanta Inc.	24.75	0.00	0.0
NYS	81.50	59.38	Southwestern Bell Corp. (H)	77.50	-3.25	-4.0
NYS	33.25	21.00	Sprint Corp. (H)	33.13	0.38	1.1
OTC	27.00	8.75	Standard Microsystems Corp	13.38	-1.38	-9.3
OTC	18.50	6.88	Stratacom Inc.	12.25	0.75	6.5
OTC	107.50	19.75	Synoptics Communications	106.25	-0.50	-0.5
OTC	7.13	4.25	Telebit Corp.	4.38	-0.25	-5.4
OTC	9.38	2.13	Telematics Int'l Inc.	6.63	-0.50	-7.0
OTC	25.50	13.38	US Robotics	19.25	-1.75	-8.3
NYS	44.38	34.38	U S West Inc. (H)	42.88	-0.63	-1.4
OTC	46.50	12.00	Wellfleet Communications (H)	40.50	-1.75	-4.1
OTC	18.50	7.00	Xircom	9.25	0.13	1.4
PC'S AND WORKSTATIONS					Off 0.2%	
OTC	7.25	2.50	Advanced Logic Research (L)	2.88	0.00	0.0
OTC	65.25	41.50	Apple Computer Inc.	49.75	1.25	2.6
OTC	24.25	11.25	AST Research Inc.	13.75	0.38	2.8
NYS	13.38	4.38	Commodore Int'l	4.50	0.00	0.0
NYS	58.50	22.25	Compaq Computer Corp.	49.38	-1.75	-3.4
OTC	49.88	15.00	Dell Computer Corp.	28.38	-3.38	-10.6
NYS	82.88	50.25	Hewlett Packard Co.	73.38	-0.38	-0.5
NYS	33.00	14.88	Silicon Graphics	31.88	4.38	15.9
OTC	41.00	22.50	Sun Microsystems Inc.	26.00	-1.00	-3.7
NYS	32.13	22.25	Tandy Corp.	28.75	-0.63	-2.1
OTC	11.00	2.75	Zeos International Ltd.	4.38	-0.13	-2.8
LARGE SYSTEMS					Off 2.9%	
ASE	18.38	5.75	Amdahl Corp.	5.75	-0.13	-2.1
NYS	120.25	4.25	Convex Computer	4.75	0.13	2.7
OTC	6.13	1.88	Cray Computer	2.75	-0.38	-12.0
NYS	39.75	19.00	Cray Research Inc.	28.75	1.00	3.6
NYS	13.88	7.13	Data General Corp.	9.38	-1.25	-11.8
NYS	49.25	30.38	Digital Equipment Corp.	43.38	2.25	5.5
NYS	38.63	26.63	Harris Corp.	36.88	-0.75	-2.0
NYS	100.38	45.88	IBM	48.00	-0.88	-1.8
OTC	22.00	5.50	Kendall Square Research	14.50	-1.63	-10.1
NYS	122.00	83.00	Matsushita Electronics	119.25	-1.75	-1.4
OTC	17.00	6.00	Pyramid Technology	13.63	0.63	4.8
OTC	24.00	11.13	Sequent Computer Sys.	18.75	1.63	9.5
OTC	16.38	1.38	Sequoia Systems Inc.	2.25	-0.25	-10.0
NYS	48.50	29.50	Stratus Computer Inc.	33.63	0.88	2.7
NYS	16.88	9.88	Tandem Computers Inc.	10.75	-1.63	-13.1
NYS	13.88	7.75	Unisys Corp.	11.50	-1.75	-13.2
ASE	5.13	0.06	Wang Labs Inc. (B)	0.50	0.00	0.0
SOFTWARE					Off 0.2%	
OTC	49.25	25.25	Adobe Systems Inc.	47.25	3.00	6.8
OTC	22.25	10.25	Aldus Corp.	15.88	-1.13	-6.6
OTC	16.63	5.63	American Software Inc.	6.38	-0.63	-8.9
OTC	28.13	9.75	Ask Computer Systems	11.00	-2.25	-17.0
OTC	56.50	27.75	Autodesk Inc.	42.13	0.88	2.1
OTC	15.00	2.63	Bachman Info. Systems (L)	2.63	-0.88	-25.0
OTC	43.00	34.75	BGS Systems Inc.	37.00	-1.75	-4.5
OTC	84.13	37.25	BMC Software Inc.	45.25	1.00	2.3
OTC	28.25	17.00	Boole & Babbage	24.25	0.25	1.0
OTC	54.50	17.50	Borland Int'l Inc.	22.50	2.75	13.9
OTC	6.50	3.00	CE Software	3.38	-0.13	-3.6
ASE	23.34	6.25	Cheyenne Software Inc.	23.00	1.13	5.1
OTC	19.50	6.25	ChipSoft	10.00	0.00	0.0
OTC	9.75	5.63	Cognos Inc.	6.63	0.13	1.9
NYS	27.38	10.88	Computer Associates	23.00	-0.13	-0.5
NYS	12.38	3.25	Computervision Corp. (L)	3.38	-0.38	-10.0
OTC	34.25	19.25	Compuware Corp.	23.25	-0.75	-3.1
OTC	15.75	6.50	Comshare Inc.	6.75	-0.88	-11.5
OTC	17.25	10.75	Corel Corp.	13.63	-1.13	-7.6
OTC	29.25	6.00	Easel Corp.	6.50	-1.50	-18.8
OTC	25.25	12.00	4th Dimension	19.00	-1.25	-6.2
OTC	22.75	6.50	Frame Technology (L)	6.50	-0.13	-1.9
OTC	20.75	10.50	Group I Software	13.00	2.50	23.8
OTC	35.25	19.50	Gupta (L)	21.00	-1.63	-7.2
OTC	8.75	3.50	Hogan Systems Inc.	7.00	-0.13	-1.8
OTC	25.75	11.25	IMRS	15.25	2.88	23.2
OTC	34.75	18.50	Information Resources	28.75	-0.38	-1.3
OTC	42.00	12.13	Informix Corp.	33.63	3.88	13.0
OTC	18.50	10.25	Intergraph Corp.	10.25	-0.38	-3.5
OTC	13.63	7.75	Interleaf Inc.	9.25	0.38	4.2

Exch	52-Week High	52-Week Low		April 23 3 PM	Wk Net Change	Wk Pct Change
OTC	18.00	6.75	Intersolv Inc.	7.50	0.50	7.1
OTC	16.00	8.25	Knowledgeware Inc. (L)	8.25	-1.00	-10.8
OTC	54.75	27.75	Legent Corp.	27.75	-2.75	-9.0
OTC	33.75	14.75	Lotus Development	24.75	-0.75	-2.9
OTC	23.00	7.75	MathSoft	9.75	1.75	21.9
OTC	23.25	5.25	McAfee Associates	7.50	2.25	42.9
OTC	12.63	1.88	Meca Software (H)	11.38	-0.13	-1.1
OTC	15.00	5.25	Mentor Graphics	8.75	0.50	6.1
OTC	46.00	27.25	Micro Focus	32.00	-2.00	-5.9
OTC	19.00	4.38	Micrografx Inc.	4.88	-0.25	-4.9
OTC	95.00	65.50	Microsoft Corp.	82.00	-5.25	-6.0
OTC	37.50	12.00	Oracle Corp.	33.75	0.38	1.1
OTC	31.88	15.38	Parametric Technology	25.75	-0.25	-1.0
OTC	40.50	22.50	Peoplesoft	29.25	0.25	0.9
OTC	9.50	3.50	Phoenix Technologies	4.88	-0.75	-13.3
OTC	40.00	28.50	Powersoft	29.25	-4.50	-13.3
OTC	25.00	11.25	Platinum Technology	13.00	-0.25	-1.9
OTC	61.50	29.00	Progress Software Corp.	35.25	0.50	1.4
OTC	18.00	2.94	Quarterdeck Office Sys.	3.72	0.09	2.6
OTC	24.50	11.75	Rainbow Technologies Inc.	20.75	2.50	13.7
OTC	16.00	4.00	Rasterops	5.50	0.88	18.9
OTC	15.25	3.63	Ross Systems	11.50	-0.13	-1.1
OTC	27.25	8.50	Sapiens USA Inc.	25.75	0.00	0.0
OTC	19.50	4.75	Software Publishing Corp.	8.00	-0.13	-1.5
OTC	9.13	2.00	Software Toolworks Inc.	7.75	-0.13	-1.6
OTC	4.88	0.75	Spinnaker Software	1.50	-0.13	-7.7
OTC	12.75	3.25	State of the Art	9.75	-0.25	-2.5
NYS	24.63	13.75	Sterling Software Inc.	20.13	-0.75	-3.6
OTC	18.75	8.00	Struct. Dynamics Research	16.50	0.50	3.1
OTC	62.25	21.00	Sybase Inc.	56.00	0.50	0.9
OTC	44.25	5.88	Symantec Corp.	13.13	-0.13	-0.9
NYS	12.50	5.25	Systems Center Inc.	10.50	-0.50	-4.5
OTC	25.50	10.00	System Software Assoc.	12.75	0.50	4.1
OTC	7.75	2.50	Trinzic Corp.	3.88	-0.06	-1.6
OTC	22.75	9.13	ViewLogic Systems	15.25	0.50	3.4
OTC	23.50	6.75	Walker Interactive Systems	6.75	-0.75	-10.0
OTC	3.19	1.38	Wordstar	2.13	0.13	6.3
SEMICONDUCTORS					Up 0.5%	
NYS	31.00	7.38	Advanced Micro Devices (H)	31.00	7.25	30.5
NYS	21.38	9.00	Analog Devices Inc.	18.00	-2.00	-10.0
OTC	20.75	7.63	Atmel Corp. (H)	20.13	-0.25	-1.2
OTC	9.38	2.75	Chips and Technologies (L)	3.25	0.13	4.0
OTC	39.75	16.25	Cirrus Logic	21.13	0.63	3.0
NYS	12.38	6.38	Cypress Semiconductor Corp	10.25	0.25	2.5
NYS	16.13	7.00	Dallas Semiconductor	12.63	-1.00	-7.3
OTC	121.25	46.50	Intel Corp.	93.00	-17.75	-16.0
NYS	14.13	4.88	LSI Logic Corp.	11.75	-0.13	-1.1
NYS	28.50	12.88	Micron Technology	22.38	1.75	8.5
NYS	74.88	47.13	Motorola Inc.	71.38	-0.13	-0.2
NYS	14.13	8.50	National Semiconductor	12.38	-0.50	-3.9
OTC	18.50	7.25	Sierra Semiconductor	7.25	-4.13	-36.3
OTC	38.50	22.25	SynOpsys	35.25	2.75	8.5
NYS	53.38	32.25	Texas Instruments	55.63	1.13	2.1
OTC	8.88	6.00	VLSI Technology	7.13	0.50	7.5
OTC	7.63	2.13	Weitek	6.25	0.63	11.1
ASE	9.63	3.75	Western Digital Corp.	4.88	-0.25	-4.9
OTC	37.50	14.50	Xilinx	33.13	1.25	3.9
OTC	27.84	12.50	Zilog Inc.	25.25	2.25	9.8
PERIPHERALS AND SUBSYSTEMS					Up 1.9%	
OTC	33.75	10.38	American Power Conversion	27.63	-2.38	-7.9
OTC	20.16	13.66	Banctec Inc.	18.25	1.50	9.0
OTC	18.00	6.25	Cambex Corp.	7.25	-1.75	-19.4
ASE	18.38	6.50	Cognitronics Corp.	7.50	0.38	5.3
NYS	25.50	12.50	Conner Peripherals (L)	13.13	0.63	5.0
OTC	38.50	10.75	Creative Technologies Inc.	28.25	-0.75	-2.6
OTC	30.75	14.25	Data Race Inc.	19.50	-0.50	-2.5
ASE	17.00	4.75	Dataram Corp.	9.00	0.13	1.4
NYS	28.75	8.16	EMC Corp.	28.75	3.75	15.0
OTC	10.50	5.38	Emulex Corp.	7.38	-1.38	-18.0
OTC	19.00	13.25	Evans & Sutherland	15.88	-0.13	-0.8
OTC	38.25	12.00	Exabyte	13.63	0.50	3.8
OTC	26.00	7.09	Intelligent Info. Systems	23.50	4.25	22.1
OTC	8.88	3.88	Iomega Corp.	4.25	0.13	3.0
OTC	23.00	5.75	IPL Systems Inc.	7.00	0.75	12.0
OTC	24.00	10.75	Komag Inc.	16.25	-1.00	-5.8
OTC	19.63	6.75	Maxtor Corp. (L)	6.75	-0.13	-1.8
OTC	11.75	5.75	Micropolis Corp. (L)	6.38	0.13	2.0
NYS	116.00	92.25	3M Corp (H)	113.13	-1.88	-1.6
OTC	7.75	4.00	Printronix Inc.	7.00	0.00	0.0
NYS	17.13	6.88	QMS Inc.	16.50	0.25	1.5
OTC	17.88	11.63	Quantum Corp. (L)	13.00	0.88	7.2
OTC	12.75	3.50	Radius Inc.	3.81	-0.06	-1.6
NYS	16.25	7.50	Recognition Equipment	13.13	-0.75	-5.4
OTC	13.88	5.25	Rexon Inc.	5.25	-1.00	-16.0
OTC	22.38	12.00	Seagate Technology	15.38	1.88	13.9
NYS	49.50	18.00	Storage Technology	27.13	1.50	5.9
NYS	27.88	16.88	Tektronix Inc.	26.50	-0.88	-3.2
NYS	88.88	66.75	Xerox Corp.	78.88	-1.50	-1.9
SERVICES					Off 3.5%	
OTC	23.50	12.66	American Mgmt. Systems	19.13	-4.00	-17.3
NYS	4.75	3.00	Anacomp Inc.	3.50	-0.38	-9.7
OTC	35.75	16.25	Analysts Int'l	25.75	0.00	0.0
NYS	56.13	38.75	Auto Data Processing	47.88	-0.50	-1.0
NYS	17.25	9.41	Ceridian Corp.	15.13	0.00	0.0
NYS	17.38	12.50	Comdisco Inc.	15.38	0.00	0.0
OTC	8.66	4.50	Computer Horizons	7.75	-0.25	-3.1
NYS	80.50	57.00	Computer Sciences	70.63	-2.50	-3.4
NYS	9.63	6.88	Computer Task Group	6.88	-0.63	-8.3
NYS	40.50	22.00	CompUSA Inc.	29.00	-1.50	-4.9
OTC	17.50	6.00	Corporate Software	12.00	-2.00	-14.3
OTC	26.00	7.38	Egghead Discount Software (L)	8.63	1.00	13.1
NYS	35.88	25.25	General Motors E (EDS)	33.13	1.13	3.5
OTC	16.50	9.25	Inacom Corp.	17.13	-0.38	-2.1
OTC	15.38	6.25	Intelligent Electronics	13.25	0.50	3.9
OTC	14.38	6.63	Merisel	9.88	-1.25	-11.2
OTC	14.75	5.75	Microage Inc. (H)	13.00	-1.25	-8.8
NYS	43.00	21.75	Paychex	40.75	-2.00	-4.7
NYS	87.25	37.00	Policy Management Sys.	42.38	-3.25	-7.1
NYS	35.38	16.81	Reynolds and Reynolds	32.88	-2.13	-6.1
OTC	31.75	22.00	SEI Corp.	28.25	-0.25	-0.9
OTC	24.38	16.88	Shared Medical Systems	20.00	-0.50	-2.4
OTC	13.88	5.75	SHL Systemhouse	11.00	0.13	1.1
OTC	29.25	18.25	Software Spectrum Inc.	23.50	0.13	0.5
NYS	33.75	21.75	Sungard Data Systems	30.75	-0.25	-0.8
NYS	4.00	1.13	Ultimate Corp.	3.25	-0.25	-7.1

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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In Brief

Novell ready to buy

Novell, Inc. last week said it plans to acquire **Software Transformations, Inc.**, an application development tools maker in Cupertino, Calif. [CW, April 19]. The deal calls for Novell to give Software Transformations' owners 800,000 shares of Novell stock, worth about $25.8 million. Software Transformations' object-oriented tools for building Unix, Windows and Macintosh systems give NetWare users a framework for creating client/server applications that run over PC networks, a Novell spokesman said.

DEC spin-off

Digital Equipment Corp. is spinning off a company that specializes in refurbishing and manufacturing disk and tape drives, as well as modules. Called **SpringBoard Technology Corp.**, the company will work out of DEC's Springfield, Mass., manufacturing plant and is expected to eventually employ approximately 100 people. SpringBoard will handle 5¼-in. hard drives, 8mm and 4mm digital audio tape drives and DEC's proprietary cartridge tape drives.

TI buys stake

Texas Instruments, Inc. has agreed to buy a minority stake in **PeerLogic, Inc.**, a San Francisco developer of middleware. TI will also remarket PeerLogic's Pipes software both as a standalone product and with the Information Engineering facility, its computer-aided software engineering tool.

SHORT TAKES **Auspex Systems, Inc.** in Santa Clara, Calif., has filed an initial public offering, proposing to sell 5 million shares at $10 to $12 a share.... **Platinum Software Corp.** in Irvine, Calif., has acquired **Automation One**, an Australian developer of accounting software.

ISO standard attracts U.S. interest

Users demand adherence to quality specs for building software

By Gary H. Anthes

A series of quality standards developed by the International Standards Organization (ISO) in Geneva is catching on in Europe and is beginning to attract serious attention in the U.S. from sellers and buyers of information technology.

Measuring up to the ISO 9000 quality standard is a lot less difficult than winning a Malcolm Baldrige National Quality Award, but hardware and software vendors said it can make a valuable contribution to product and customer service quality. And, they said, an ISO 9000 stamp of approval offers an increasingly important competitive advantage.

"Within two to three years, the American software company that is not ISO 9000-registered will not be competitive, period," said R. Douglas MacIntyre, president of Software 2000, Inc., a Hyannis, Mass.-based developer of business applications for IBM's Application System/400s.

ISO 9000 certification, or "registration," is granted after a company has passed an audit by an accredited third party. The registration attests that a particular site has complete documentation and rigorous procedures to ensure quality in contracting, manufacturing, customer service, software development and other functions (see story at right).

"It's no longer a European issue; the genie is out of the bottle in the U.S.," said Robert Kennedy, ISO 9000 program director at Digital Equipment Corp., which has received ISO 9000 registration for 19 plants in the U.S. "Customers are asking their suppliers about ISO 9000 registration," he said.

Ed Kane, vice president for quality at Dun & Bradstreet Software, said the company has postponed until 1994 a major push to get U.S. sites registered under ISO 9000 but has completed the process for its facility in the UK.

Jean-Louis Olie, chief executive officer at Alsys, Inc. in Reston, Va., said the computer-aided software engineering developer had already embarked on its own program to get ISO 9000 registration when its parent company, Thompson-CSF, Inc. in Arlington, Va., mandated that all Thompson units that develop software obtain such certification.

Olie said European and U.S. customers are beginning to ask in requests for proposals whether bidders are ISO 9000-compliant. "It's a plus if you can say, 'Yes,'" he said.

Not all companies seeking ISO 9000 registration for their software development work are software vendors. Becton Dickinson & Co. has no ISO 9000-registered facilities yet but is gearing up for registration in a number of areas, including two of its 18 divisions where software is developed for medical diagnostic instruments.

Woody Green, Becton Dickinson's director of quality assurance and regulatory affairs, said ISO 9000 registration pays dividends in terms of quality improvement and public relations. However, he said a rush to jump on the ISO 9000 bandwagon has led to some abuses by vendors. "Sometimes advertisements imply that ISO has blessed what a firm does," he said. "That is not the case."

And MacIntyre warned against seeing the quality standard as a guarantee for business success. "There is the same criticism of ISO 9000 as there is of the Baldrige award," he said. "It is quite possible to win the Baldrige and then go into Chapter 11 [bankruptcy]."

Wise to conform

A survey of 2,317 ISO 9000-registered companies by Pera International and Salford University Business Services Ltd. for the British government revealed that 89% reported greater operational efficiency as a result of ISO 9000 conformance; 48% reported increased profitability; 76% reported improvements in marketing; and 26% reported increased export sales.

Stamp of approval

ISO 9000 refers to a series of five related quality management standards. The most comprehensive of the standards encompasses 20 business functions, such as contract review, design control, document control, purchasing, inspection and testing, training and maintenance.

The standards are geared to two-party transactions, and they assess a supplier's ability to fulfill the customer's contractually specified requirements.

ISO 9000-registered sites are audited every three years and receive less comprehensive "surveillance visits" every six months.

A substandard developed specifically for software development deals with issues such as protection of proprietary information, change management, project planning, configuration management, acceptance testing and maintenance. —*Gary H. Anthes*

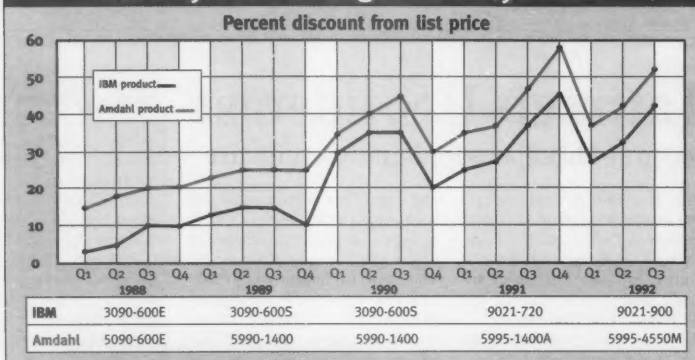
First-quarter earnings, calendar 1993

Company	Revenue January through March	Percent change from 1992	Net income January through March	Percent change from 1992
The Ask Group, Inc.	$100.5M	(8%)	($674,000)	NM*
AST Research, Inc.	$370M	53%	$11M	(34%)
Compaq Computer Corp.	$1.6B	106%	$102.4M	126%
Data General Corp.	$267.4M	(2%)	($7.6M)	86%
Gupta Corp.	$11M	83%	$654,000	1,182%
IBM	$13.06B	7%	($285M)	NM*
Peoplesoft, Inc.	$10M	83%	$1.2M	99%
Sun Microsystems, Inc.	$1.14B	20%	$51.7M	(19%)
Sybase, Inc.	$80.1M	55%	$6.2M	144%
Tandem Computers, Inc.	$517.6M	3%	$11.1M	26%
Unisys Corp.	$1.9B	(5%)	$260.6M	440%
Wellfleet Communications, Inc.	$48.1M	113%	$7.6M	110%

* Not meaningful

IBM continues to struggle with weak demand for its mainframe and large disk drive products, which has caused another quarterly loss despite increases in service revenue and decreases in operating expenses.
Compaq reported robust results, posting $1.6B in sales while driving operating expenses down to 13.4% of revenue.
Gupta Corp. pulled off a strong quarter, increasing both product and service revenue by 78% and 107%, respectively, over the corresponding quarter of 1992.
In its first full quarter as a public company, **Peoplesoft** nearly doubled its earnings, crediting a number of relatively large contracts with an average value in excess of $400,000.
Sun reported record revenue of $1.14B, but due to gross margin declines, profits were less than their level a year ago.

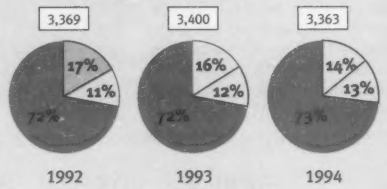
Industry Pulse: Large-scale systems*



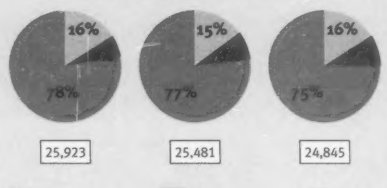
IBM	3090-600E	3090-600S	3090-600S	9021-720	9021-900
Amdahl	5090-600E	5990-1400	5990-1400	5995-1400A	5995-4550M

Constricting market

TOTAL WORLDWIDE SHIPMENTS



TOTAL WORLDWIDE INSTALLATIONS



*IDC defines large-scale systems as systems with an average value exceeding $1 million.

Industry distribution

PERCENT OF SITES WITH ONLY MAINFRAMES INSTALLED. DOES NOT INCLUDE PCS.

1% Agriculture/Mining/Construction
10% Process manufacturing
11% Discrete manufacturing
6% Transportation/Utilities
13% Wholesale/Retail
9% Bank/Savings & loan
10% Finance/Insurance
4% Business services
11% EDP services
11% Medical/Education
14% Government

Source: International Data Corp./ Computer Intelligence

CW Chart: Nancy Kowal

The Fifth Wave *by* Rich Tennant

"TECHNICALLY HE'S A WIZARD, BUT AS A MANAGER HE LACKS PEOPLE SKILLS."

Inside Lines

Cozying up

DEC is warming to the Unix Common Open Systems Environment (COSE) initiative. The company has held a series of discussions with the group aimed at discovering which technologies the Maynard, Mass., manufacturer can offer and what role the company can play, according to Vicki Farrell, director of Unix marketing at DEC. The primary negotiater representing COSE is former DECie and current Hewlett-Packard executive Gary Eichorn.

DME delayed

The Open Software Foundation will ship its Distributed Management Environment (DME) services later this year but will push back the release of the DME framework until the first half of 1994, according to internal sources. One reason for the delay is DME's use of the CORBA standard from the Object Management Group. Implementations of CORBA can comply with the standard, but they aren't interoperable, which is an "intolerable" situation, the source said. Seeking extra cash and support, the OSF is also negotiating with Petrotechnical Open Software Corp. to jointly sponsor certain OSF initiatives, though no deals have yet been finalized.

Feline callings

June will see the fruits of an HP and Microsoft joint venture, according to sources. The two intend to ship a 2.9-pound "superportable," code-named Lion, early in June. The Lion features DOS, Windows, Word and Excel in read-only memory, HP's 1.3-in. Kittyhawk hard drive and two PCMCIA bays. The product will run on AMD's AM386SXLV chip and is expected to achieve five to 10 hours of battery life. The Lion can also run on AA batteries if need be, sources said. Pricing is expected to be near $2,000, several sources said, or $2,300 with flash cards. Cats are in at HP, which has code-named its 95LX follow-on Cougar. Look for the 95LX on May 4.

One-stop shopping

A swarm of start-ups is converging where no database administrator has gone before: at the boundary of Unix operating systems and Unix relational databases. They are attempting to recreate the glass house's automated mainframe consoles for open systems. Some will show their wares at this week's Oracle developers' conference near San Francisco, including year-old EcoSystems Software, Inc. in Cupertino, Calif. Among the new kids on the block are Patrol Software, Inc., a Redwood City, Calif., firm started by Oracle alumni from Australia, and Open Vision Technologies, Inc. in Pleasanton, Calif., started by Michael Fields, a former Oracle sales executive who reportedly has $25 million in funding to acquire monitoring technology.

That's a terminator, all right

West Virginia University data communications manager Jeff Fritz was unpleasantly surprised last week when he was informed by his local telephone company that AT&T had slapped a 200% price increase on ISDN terminators, the little boxes that provide customer lines with access to ISDN services. The extra $200 per ISDN Basic Rate Interface will put a real damper on ISDN deployment, particularly for data users who require a whole ISDN link, Fritz said. AT&T says it didn't change the price; although a two-year promotional price program to local telcos recently ended.

A high school hacker managed to change the electronic sign boards along Interstate 95 in Connecticut to say, "You all suck." The boards are used to announce construction, fog, weather conditions and so forth. It took the state police and highway department several hours to clear the message. Then it happened again with a different message attacking the governor. After they caught the kid, he told police that changing the message was easy once he got into the highway department's computer because no password was required. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld*'s 24-hour voice-mail tip line at (508) 820-8555.*

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APRIL 29, 1991
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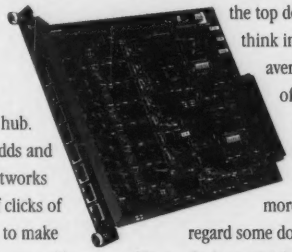

Chipcom has always seen networking differently than its competitors. Which, given the difference in our backgrounds, isn't surprising.

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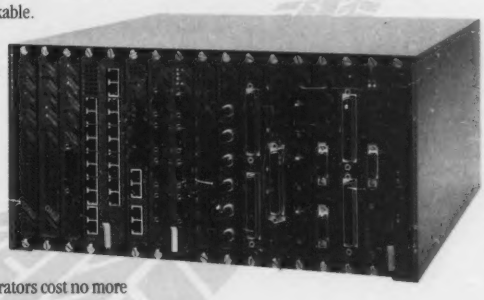

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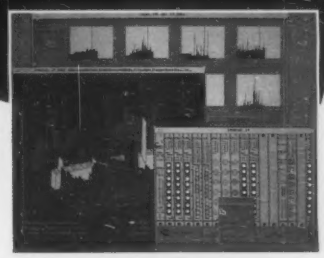

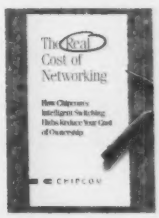

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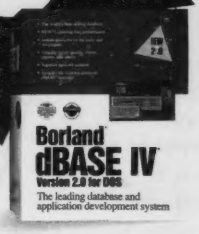

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Designed for programmers	Yes	Yes
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Full cross-platform compatibility	Yes	No
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Multiuser ready	Yes	No

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